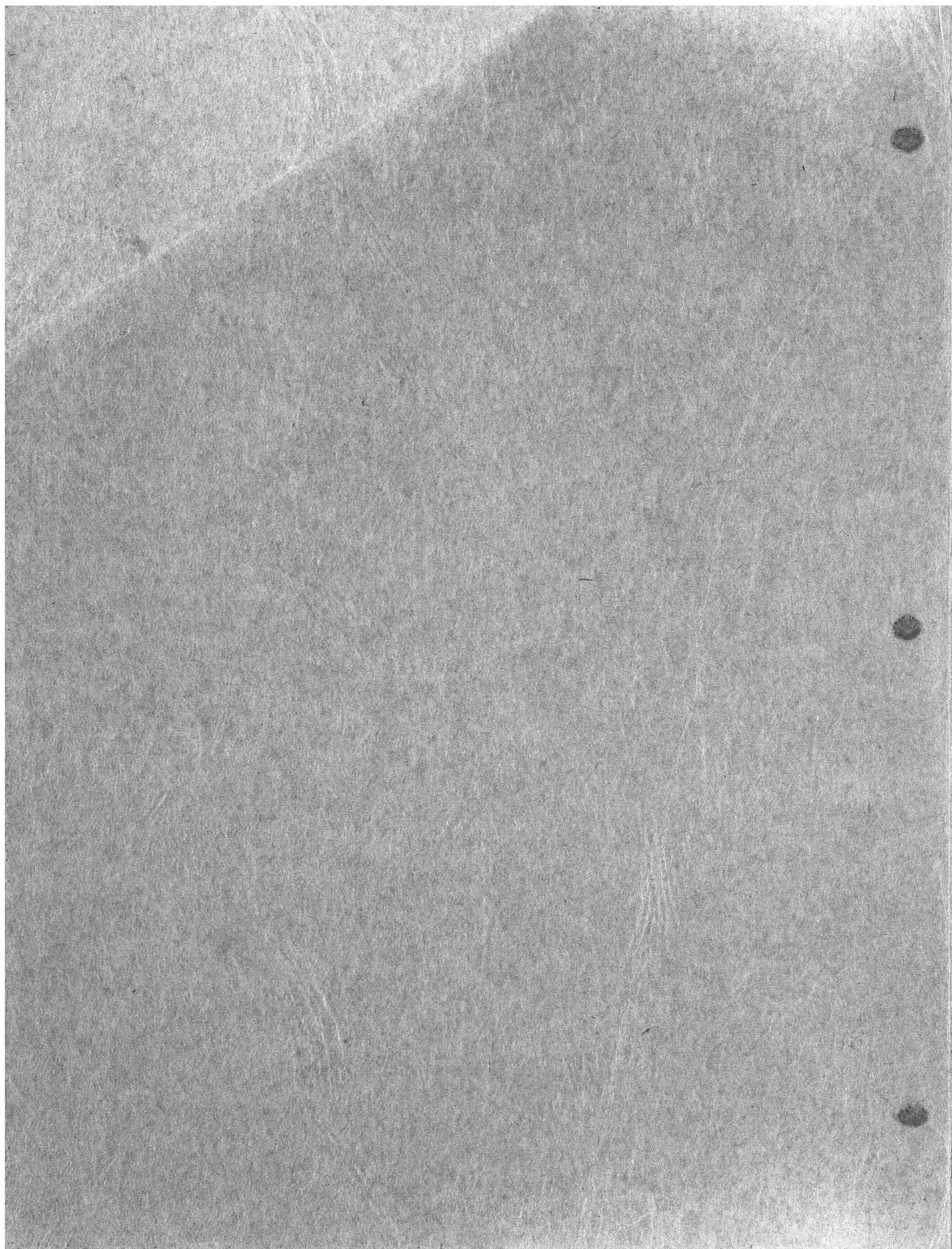

DUCKS UNLIMITED
Census 1938 & 1939

|||
and
|||

KEE-MAN
RECORD BOOK



P40

DUCKS UNLIMITED (Canada)

Census 1938 & 1939

and

Kee-man Record Book

A report of the wild duck population of North America's vast duck factories in the Canadian West; assembled with the persistent and active co-operation of hundreds of Ducks Unlimited (Canada) Kee-men — across Alberta, Saskatchewan and Manitoba.

Ducks Unlimited (Canada)

Winnipeg Regina Edmonton



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The Beaver is Nature's great conservator. These engineers, in millions, once built dams and stored waters in our Canadian West. The beaver were destroyed; their dams failed; water drained out of their countless ponds and lakes. Over vast stretches of our Northland, water levels broke loose in the wild fluctuations of flood and drought.

Ducks Unlimited is co-operating in the work of restocking former beaver habitat. The restoration of beaver is basic in the restoration of our vast marshlands. Beavers will build dams; store water at controlled levels; and give ducks (and other useful wildlife) the opportunity for producing bumper crops.

Acknowledgements

E gratefully acknowledge the splendid co-operation of thousands of individual workers and organizations who voluntarily have taken an active part in the great work of restoration.

In developing a program to restore and multiply the wild duck population, Ducks Unlimited is particularly indebted to the Game and Fish Associations of Alberta, Saskatchewan and Manitoba; the Hudson's Bay Company; the press; co-operating radio stations; Dominion and Provincial Government authorities; and finally to the 3,400 co-operators who have acted as our own good Kee-men—in returning valuable reports in the spring, during the census and again at freeze-up.

Thanks are tendered also for assistance given by the United States Bureau of Biological Survey and the American Wildlife Institute, each of whom assigned a biologist to take part in the 1939 aerial census.

With this whole-hearted co-operation, the work of waterfowl restoration has been launched with striking success. It can be carried forward—in permanently expanding scope and usefulness with the continued co-operation of the foregoing and of all who are sincerely interested and willing to co-operate therein.

DUCKS UNLIMITED (CANADA)

Permission is hereby given for the use of any or all of the material herein presented, in any manner which will promote restoration of useful wildlife and conservation of resources.

A Personal Message

To Our Ducks Unlimited (Canada) Kee-Men

Dear Friend:

Please accept this booklet as a token of thanks for your genuine interest in wildlife; and for your co-operation (with Ducks Unlimited) in the great work of waterfowl restoration. This booklet shows how your active co-operation contributes directly to the conservation of wildlife and water resources. We hope it helps you reap increasing satisfaction from continued participation in this vital work.

Restoring our wild ducks and duck-waters is a big job. It is being done — with your help. Two things are essential to success. 1. Funds; 2. Co-operation. Both are being made available in steadily increasing volume — through Ducks Unlimited.

Ducks Unlimited is an international non-profit organization — created as a trustee to bring together available funds and co-operation; and to co-ordinate the investment of both in restoration work which guarantees utmost returns in more ducks. Ducks Unlimited comprises two affiliated organizations: Ducks Unlimited, Incorporated, in the United States; and Ducks Unlimited (Canada), in our Dominion.

Funds From The United States

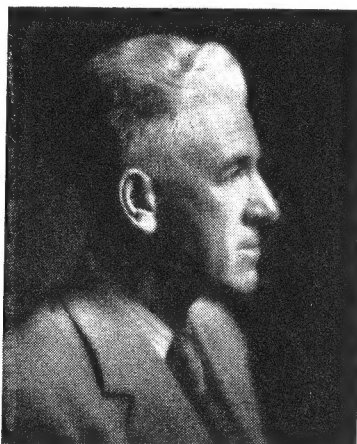
Funds come from Ducks Unlimited, Inc. This is an organization of United States sportsmen. They are not millionaires (as sometimes rumoured). They are ordinary people, just like yourself, who are interested in wildlife. They want to invest in the restoration of wild ducks. As the best way of doing that, they become members of Ducks Unlimited, Inc. A few invest \$100 or even \$1000. The majority put up \$2.00 a year. Their average investment is \$6.00 per year, each. Since May 1, 1938, they have provided \$225,000. They are steadily adding to their membership. They plan eventually to make available \$600,000 per year.

All this money is entrusted to Ducks Unlimited (Canada). We invest it in restoring

North America's great duck breeding range in our Canadian West.

Co-operation By Canadians

Our duck production range covers 631,000 square miles — from the Great Lakes and Hudson Bay to the Rockies, and north to the Mackenzie Delta. Increasing production over this vast expanse is a gigantic work. It can be done — by saving, restoring and developing the waters of our Canadian West. Clearly, Ducks Unlimited cannot do this tremendous job alone. It demands the co-operation of every individual and every organization interested in the welfare of our land.



T. C. MAIN, General Manager

Ducks Unlimited does provide a permanent, active centre — dedicated to conservation — through which you (and everyone genuinely interested in restoration) can co-operate to achieve that purpose.

Canadians are co-operating whole-heartedly in this great work. Individuals and Governments are contributing work and property — to guarantee utmost results from every dollar invested by United States sportsmen, through Ducks Unlimited.

Reaping Returns

The total income of D.U. (Canada) is the money entrusted to us by the members of D.U. Inc. in the United States. We invest all these funds in Western Canada — with the co-operation of sincere individuals (like yourself) and agencies interested in restoration.

Returns from your investment are already apparent. The first dividends are: increased waterfowl over the entire continent — *plus* conservation of water in our Canadian West. As the work expands it will yield increasing returns in restored wildlife, water and other resources.

A Foundation of Facts

Conservation must be based upon full and accurate information. Getting information on ducks and duck waters is the first step in our restoration program in Western Canada. You (and 3400 other good Kee-men) have helped us assemble this essential information — by

sending in Spring Reports, Census Reports and Freeze-up Reports on ducks and waters in your neighborhood. Thus, you have helped lay the foundation of a permanent restoration program.

Hundreds of volunteers helped take the first wild duck census in Western Canada, in 1935. They represented every variety of industry, interest and community. One thing they had in common: a sincere concern in the restoration of wildlife. In 1938, and again in 1939, an army of co-operators worked with Ducks Unlimited in this census work; and, also, contributed Spring and Freeze-up Reports.

These are our Kee-men. Truly they are the key to success in this work of restoration. They invest experience and work; time and expenses; without direct remuneration. Their compensation is the certainty that each is vitally contributing to conservation.

Your Kee-Man Record Book

It is impossible to pay you adequately for your investment in this conservation program. Yet we feel that some concrete recognition of your contribution is overdue. Therefore, we send you the "Kee-man Record Book" — as a token that we do appreciate your splendid co-operation.

Your "Kee-man Record Book" is loose-leaf. It contains summary reports of census work in 1935, 1938, and 1939; beautiful colored illus-

trations of ducks and other birds; and a section of black-and-white-pictures, with notes on the field marks by which various ducks may be identified.

We plan to send you further pages, from time to time, with up-to-date information and more color illustrations. Please bind these in your record book as they come.

We present you with your Record Book, in the hope that it will help you co-operate even more effectively in the future in this great work of restoration, which is so vital to all of us.

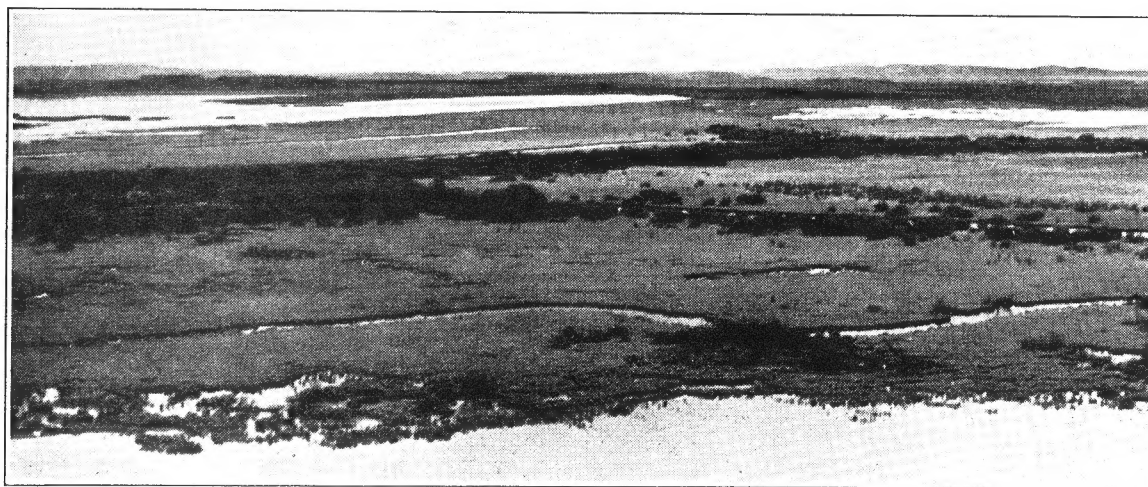
Already (with your help) 34 Ducks Unlimited projects have been constructed; and over 640,000 acres of water and nesting grounds improved.

Compared with the tremendous expanse of the duck range, this is only a start. But it is a mighty good start. With the war demanding more efficient utilization of resources, this essential conservation work (with your continued co-operation) shall carry on.

Yours for Conservation,



General Manager.



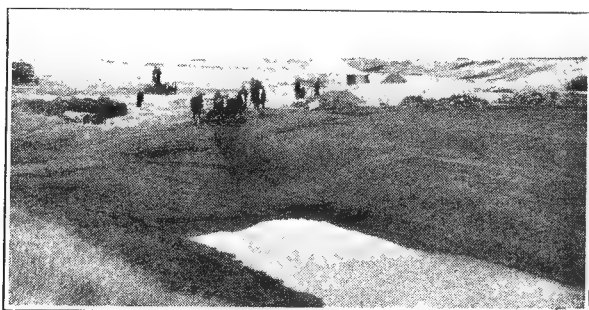
Aerial view Athabaska Delta. This 2,000,000-acre block is the greatest known duck factory.

Chapter One

DUCKS UNLIMITED

What it is — Why it is
needed — How it works

Ducks Unlimited is a continent-wide, non-profit organization, created for the specific purpose of restoring and increasing the number of North America's ducks, geese and other useful waterfowl by restoring, protecting and improving their breeding grounds in the Canadian West.



Vital restoration work—building permanent water storage.

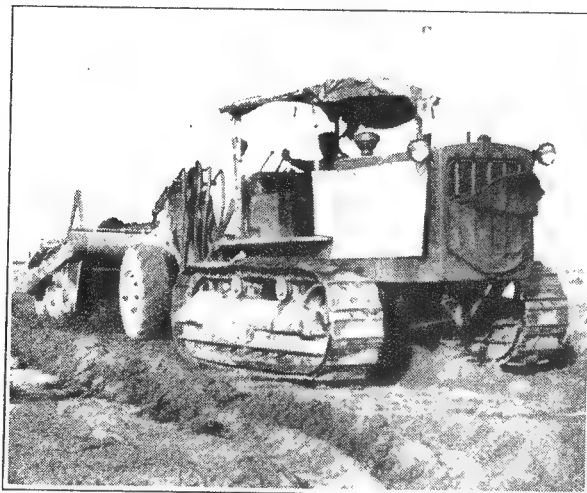
Funds to carry on this work are subscribed by United States sportsmen through a non-profit association formed for the specific purpose of fund-raising, known as Ducks Unlimited, Inc. Ducks Unlimited (Canada) was incorporated in 1937; and commenced operations on April 1, 1938. These affiliated associations were sponsored by More Game Birds in America, a foundation which made the first aerial survey of the duck breeding areas in Canada in 1935. The results of their survey convinced them that, if the sport of wildfowling was to be preserved for posterity, the sportsmen themselves must take an active part in restoration on the great breeding grounds in Canada, as these were steadily being destroyed by settlement and exploitation.

Thus, Ducks Unlimited Inc., was formed in the United States to collect the necessary funds; and Ducks Unlimited (Canada) was formed to invest these funds in constructive restoration work in Canada. \$100,000 was made available in 1938 and \$125,000 in 1939. Contributions are steadily growing and the work will be correspondingly extended as the movement gathers momentum.

More than 20,000 American sportsmen subscribe to the Ducks Unlimited programme now. Their average subscription is slightly over \$6.00 each, per annum. All the money collected by Ducks Unlimited Inc., is transferred to Ducks Unlimited (Canada) to be spent on restoration work.

Ducks Unlimited (Canada) is charged with one duty: that is, the increase of the waterfowl population of North America.

The work is carried out on the following broad lines: by building dams, dykes, ditches and dug-outs to restore or preserve suitable water areas; by close co-operation with Dominion, Provincial and Municipal governing bodies engaged in works which affect water and waterfowl breeding; by close co-operation with sportsmen, naturalists, farmers, ranchers and interested individuals throughout Western Canada: by gathering authentic information on ducks and duck waters from the whole range, and making it available to all. By



"Digging for ducks". These "cats" build dams, ditches and dugouts to guarantee water all year.

bringing restored areas under management, with the object of attaining optimum waterfowl production. This includes fencing, planting food and cover; and manipulation of water levels; control of predators, fires, overgrazing and other factors detrimental to useful wildlife.

While Ducks Unlimited concentrates on increased duck production it is clearly realized that this objective can be gained only through whole-hearted co-operation with all individuals and agencies in Canada who are sincerely interested in similar and related conservation activities.

Chapter Two

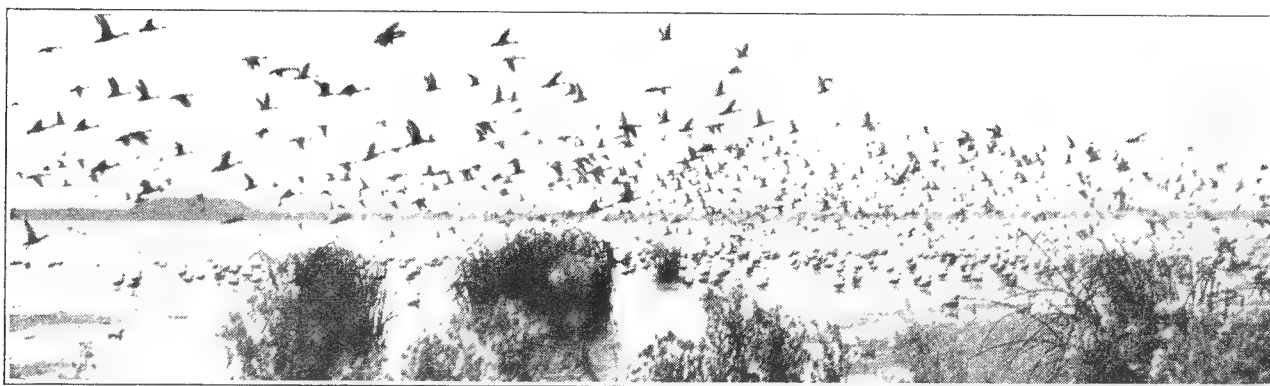
TAKING STOCK OF
THE DUCK FACTORY

Intelligent planning of the restoration programme requires comprehensive and up-to-date information from the whole of the duck breeding range.

First, it was necessary to assess the duck population, so that the trend from year to year could be watched. This was done in 1935, in the first ground and aerial survey of Western Canada's duck breeding grounds. It was repeated in 1938 and 1939, with the assistance of our Kee-man organization. The results are summarized below:

part of the work. In 1939, they were assisted by Dr. G. B. Saunders, Flyway Biologist of the United States Bureau of Biological Survey and H. A. Hochbaum, in charge of waterfowl research under the American Wildlife Institute, Michigan State College and University of Wisconsin (Co-operative Research Unit).

While this work has been designated "The Wild Duck Census," no claim is made that the figures given represent an accurate count of the ducks in Western Canada. However, the figures are based on conscientious counts by



Ducks on Freezie Lake. This is part of the Athabaska Delta — the greatest duck factory known. Over eleven million ducks there in 1939.

(Total Duck population of Manitoba, Saskatchewan and Alberta and that portion of the North-West Territories lying north of these provinces to the Arctic ocean).

1935	1938	1939
40,500,000	49,044,000	59,682,000

The duck population curve hit low in 1934. A steady (but slow) recovery was made between 1935 and 1938. In 1939 a sharp upswing is noted due to improved water conditions, predator control, sane shooting regulations and the work of Ducks Unlimited, the P.F.R.A., and other conservation agencies.

Taking stock of Western Canada's waterfowl is a major undertaking. It is accomplished only by the whole-hearted co-operation of our Ducks Unlimited (Canada) Kee-man. In addition to the ground work done in the Farmland belt, the inaccessible breeding grounds in the Northland are covered by trained observers in low-flying airplanes. In 1938 and 1939 members of the staff of Ducks Unlimited, did this

thousands of earnest men on the ground and by experienced ornithologists from the air. These observations are supplemented and re-inforced by the mass of information supplied by our 3,400 D.U. Kee-men in their Spring Reports and Freeze-up Reports. The estimates based upon all these are believed to be as close an approximation of the truth as can reasonably be expected from painstaking observation and scientific application of statistical methods. In any case, the trend, as shown by the computations given, can be accepted without reservations.

As we have said, taking stock of North America's duck factory in the Canadian West is a big job. The duck range covers 631,000 square miles. (See map on page 18). Chapter three tells how observations are taken on the ground in the Farmlands; and how estimates of duck population are worked out from the information reported by our kee-men. Chapter six details methods followed in the Northland and in the Pre-Cambrian region.

Chapter Three

TAKING THE CENSUS
IN THE FARMLANDS

Township plats, tally sheets and instructions on how to conduct the census are distributed to our Kee-men observers throughout the duck breeding range. Specimen forms are included herewith. (See pages 12 and 13). The census was conducted during the third week of July, in 1938; and the last week of July, in 1939.

For mapping purposes the National Topographical Survey, at Ottawa, has divided Western Canada into rectangular sections of about 4,500 square miles. For each such section, the Department issues a sectional map sheet. These maps are the best obtainable for taking and recording census, and other information. Therefore, our entire D.U. (Canada) records are built up on these sectional maps. Census data (as well as Kee-men and information on projects and potential developments) are filed by sectional map sheets. See map on page 21, showing distribution of duck population by sectional map sheet.



Ducks Unlimited census workers check the duck population of Quill Lake.

A Sample Census

"Work Sheet"

As the census tally sheets are received at D.U. office from our Kee-men, they are filed by sectional map sheet. When complete, they are listed as follows:

Sectional Sheet No. 70 (Moose Mountain)
Southern Saskatchewan.

Area	T.	R	M.	Duck Census	Ttl Sq. Mls.	% Inc	% Dec
36 secs.	14	7	West 2	121	36	20	
324 "	10-12	13-15	" 2	None	324		
36 "	13	6	" 2	None	36		
36 "	13	5	" 2	62	36		25
324 "	13-15	10-12	" 2	20488	324	25	
4 "	11	6	" 2	None	4		100
180 "	10-12	1-2	" 2	24	180		
½ "	9	16	" 2	338	½	25	
36 "	14	6	" 2	32	36	25	
10 "	15-16	4-5	" 2	3000	10	50	
1 "	11	15	" 2	10	1		
216 "	9-10	3-5	" 2	30488	216	75	
216 "	11-12	3-5	" 2	20000	216		
2 "	12	2	" 2	200	2		
324 "	13-15	1-3	" 2	3240	324		
288 "			" 2	20	288		
Totals				78,023	2033½		

Average ducks per sq. mile — 38.5

Total Map Area — 4566 sq. Miles.

Appraised @ 38.5 ducks per sq. mile—
duck population for whole sectional map
— 170,790.

The above sample "work-sheet" lists the total number of counts received for Map Sheet No. 70 (Moose Mountain, Saskatchewan).

Figuring Out The
Duck Population

Each count is referred to the map; and when all have been examined, the census manager decides whether the returns received can be regarded as a representative cross-section of that map sheet or not. If so, the average number of ducks per square mile, found by actual count, is applied to the whole map sheet. If not, the census manager makes due allowance for (a) insufficient number of returns to give a true cross-section; (b) preponderance of reports from highly productive areas; (c) extent of unproductive areas such as forests, large lakes, waterless regions and mountainous country; (d) personal knowledge of map sheet in question; (e) general knowledge of condi-



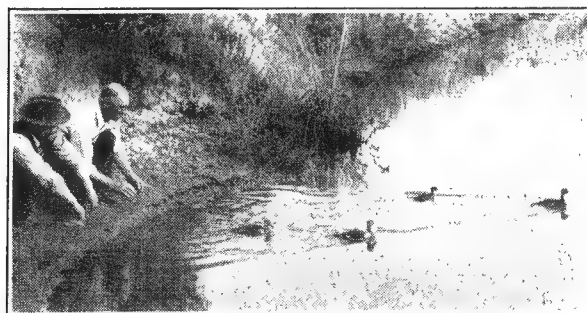
Taking ducklings salvaged from drought-dried ponds to permanent water.

tions based on Spring and Freeze-up questionnaires received from our Kee-men.

Final appraisals are made by our Chief Naturalist. To this extent the personal equation enters into the computations; but any errors resulting therefrom, may be expected to correct each other — any over-estimates canceling under-estimates.

Reports Needed—Even Where No Ducks

Another factor to be considered is that there is an obvious tendency for Kee-men to send in reports only when there are ducks to report. To get a true cross-section, it is just as necessary to receive returns reporting few or no ducks as it is to get the counts from heavy production areas. In the sample work-sheet given above, a sufficient number of returns covering a large enough area of good, bad, and indifferent duck



Releasing salvaged ducklings on good, deep water.

production country were received to give, in our opinion, a true picture of the duck population of that Map Sheet. However, the tendency certainly exists; and could result in a computed duck population greater than is actually the case. On the other hand, the difficulties of counting ducks in heavy reeds and in large marshes, and the appearance of late broods after the census is taken, offset to some extent this tendency.

To evaluate these tendencies, and apply a reduction factor, would be pure guess work. Rather than do this, it was decided to be ultra conservative in appraising the duck populations of those areas in the northern part of the provinces and North-west Territories from which few ground or aerial observations are reported.

The production from these unknown regions



1939 WILD DUCK CENSUS TALLY SHEET

DATE OF OBSERVATION Aug 10-11, 1939 Time most of day
 AREA COVERED Inter. Tar.
 Sections _____ Township 12 Range 19 Mer. W3
 IMPORTANT—SEE OTHER SIDE OF THIS SHEET

Species	Females with Broods	Total No. of Young Ducks	Total No. of Old Ducks without Broods Female and Male	Total No. of Ducks Young and Old
FORWARD	721	2716	180	3617
Red Heads	52	197	13	262
Teal	110	412	28	550
Pintail	112	419	30	561
Benrabbuck	56	210	14	280
Spoonbills	110	420	25	555
Mallards	280	1050	70	1400
CARRY FORWARD	721	2716	180	3617
NOT IDENTIFIED	58	212	12	282
TOTAL	1109	4166	277	5552

If it is not possible to locate all ducks on the area reported on, give approximate number, that should be added to total noted above to make up the total duck population

Name of Keeman

J. MacLennan

P.O. Address

Gull Lake, Sask

TOTAL DUCK POPULATION **5552**

Chapter Four

SURVEYING THE NORTHLAND — BY AIRPLANE

The aerial census covers the Northland: that portion of the duck breeding range lying between the northern limit of agriculture and the Precambrian Shield. (See Map 1, Chapter 5)

Two parties — flying out of Winnipeg, Manitoba, and Prince Albert, Saskatchewan, cover this phase of the work. In low-flying airplanes they cruise over the lakes and marshes. The ducks are estimated at so many per acre for marshes and small lakes; and at so many per running mile around the shores of larger bodies of water and rivers.

Observations are made from altitudes of 400 feet down to 100 feet, or less. Species are readily determined; and, by cruising to and fro over a marsh or lake, a calculation of the duck population can be made which closely approximates the truth. The observations are made by trained and experienced observers. In 1938 the aerial survey reached as far north as the source of the Mackenzie River, at the west end of Great Slave Lake. In 1939, the most northerly point reached was the Athabaska Delta, in northern Alberta.

Six Big Duck Factories

In this great "No Man's Land" is produced the bulk of Western Canada's duck crop — and North America's duck population. Our three successive aerial surveys show production concentrated on six outstanding areas in "No Man's Land". The balance of this vast, little-known expanse, produces tremendous numbers of ducks; but they are more widely distributed — compared to these six blocks, which are our

mass production factories. These high production centres are:

The Lakes Winnipeg — Manitoba — Winnipegosis — occupying a big part of the south half of Manitoba.

The Pas-Cumberland Marshes — embracing the deltas of the Saskatchewan River in West Central Manitoba and East Central Saskatchewan.

The central Lakes — including central Saskatchewan and east central Alberta.

Lake Claire-Athabaska Delta — in northeast Alberta.

The Slave River — in northeast Alberta and south central Northwest Territories.

Great Slave Lake-Wood Buffalo Park — in southwest Northwest Territories.

The duck population computed for these areas, from data assembled on our aerial surveys (and some ground work) are as follows:

	1935	1938	1939
Lakes Winnipeg-Manitoba-Winnipegosis	2,200,000	1,550,000	817,778
The Pas - Cumberland	3,500,000	3,900,000	4,821,277
Central Lakes	10,900,000	5,366,000	6,809,694
Lake Claire - Athabaska ...	900,000	8,000,000	12,519,650
Slave River	7,300,000	5,000,000	6,354,260
Great Slave - Wood Buffalo area	5,500,000	6,830,000	5,450,000

In addition to the above, there are concentrated production centres of somewhat smaller



This picture was taken from an airplane, flying over the far Northland. The fire extended for miles. It was one of many fires seen that day. Beyond the frontiers of settlement, these fires are almost beyond control. They sweep timber, muskeg and marsh; destroy millions of nests; drive out wildlife; and rob our land of vital water resources.

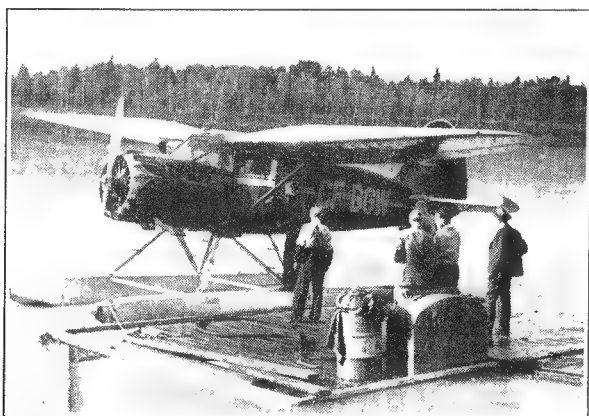
extent in west-central Saskatchewan such as:

	1935	1938	1939
Kazan Lake Area)		240,000	400,000
McCallum Lake)	300,000		
Primrose Lake)		350,000	350,000
	200,000	16,000	180,000

These lakes in northern Saskatchewan appear to be the concentration points, in August, for extensive breeding areas around them—of sloughs, pot-holes and marshlands which go dry late in the season. All three are notable for the abundance of duck food available.

Of course, the duck population doesn't "stay put" in the same spots year after year. It is as fluid as the waters upon which it swims. For instance, in 1935 flood conditions prevailed in the Lake Claire - Athabaska Delta area. Note how the population figures show shifts between this and the Central Lakes, to the south; and the Slave River, to the north.

The conduct of the aerial census is a fascinating and adventurous undertaking. Observers on each plane keep a minute-by-minute log, recording observations. Brief abstracts from the logs of each party give a picture of the aerial census in operation. From the log of the "Green Route" we quote:



Taking off from Prince Albert for Northland duck census survey.

"Wild Duck Census Report, 1938

"August 14, Sunday.

"SECTIONAL SHEET — No. 367 — Meadow Lake.

"*Meadow Lake* — Up betimes; and walk through a drizzle to breakfast. But the optimists have it and we take off at 7:15 in a heavy mist and drizzle. River shallow. Heavy growths of soft-stemmed bulrushes around mouth of river, in bays along south side of lake and at east end. We circle the lake. The water is shallow. At 200 feet we can see the vegetation covering the lake bottom. Lake shore flat, marshy, wooded. 1,000 ducks per mile for 5 miles; 1200 per mile for 10 miles. 8 miles, at

3,000 per mile (20 per acre); 3 miles at 2400 per mile (15 per acre). Area, 16½ sq. miles. Shoreline, 18 miles. Population — 27,000.



Ducks Unlimited census taken by plane and canoe in the Northland. D. U. census workers at Dore Lake.

"We head north by northeast, trying to follow the course of the Meadow River. Ceiling 400 feet; with clouds dragging over the tree tops. Visibility poor. Over bush farms, muskegs, sloughs. No ducks seen. Meadow River seems to be only a gravel channel in spots. Along the Beaver River, northeast; dwindled to a mere creek also; 50 ducks to the mile. We veer northwest, across muskegs—in township 62, range 15. No ducks seen. Over lakes 2 sq. miles in area; 1500 ducks per sq. mile. To the north and east, ¼ of total area is water—more than shown on maps.

"At 8:05 our ceiling is still 400 feet. Angus says "She won't climb any higher." Bush and farms below—and no water. We might worry, if we knew as much as our pilot does.

"Into duck country again at *Waterhen Lake*. We fly along the south shore. In a bay at the southeast corner we see 2,000 ducks; in another bay along the south shore, 300 ducks. Shores are marshy, wooded—but ducks not overcrowding. Area 29 sq. miles; shoreline, 56 miles. Population (200 per mile of shoreline)—11,200.

"West along *Waterhen River*. Fires have destroyed marsh for 4 miles upstream along north shore. In marshes along south shore, 50 ducks per acre; 5,000 ducks on 2 sq. miles. Haying in meadows along south side of river. Lakes to the north all seem full of water (Greig, Kimball, Matheson, etc.). Western reaches of river run through timber. Some farms. Fire has burned over hay flats. We circle to get some movies of the damage. 1500 ducks per mile for 9 miles. 525 per mile, 4 miles; 5 miles, 750; 11 miles, 200; 1 mile, 2000; 8 miles 50. Forty miles of river — population 38,900. At the mouth of the river, 5,000 ducks in 2 miles.

"Lac des Isles: We follow the north shore Timber down to sandy beach. Ducks crowded at west end. 500 per mile, for 5 miles, along north shore. 5 per acre on 2 sq. miles. Area, 19 square miles; shoreline, 60 miles. Population 8,500.

"Pierce Lake: Timber down to sandy beaches. Marshy at west end. Clouds come down—to blot out visibility. Then—rain! We hit for Cold Lake, intending to sit down. But it's too rough. So we cross the south corner of Cold Lake at 9:10. This is a stony-shored lake. We could not see ducks, even if they were there!"

Over the Mackenzie

Here is an abstract from the log of the party which followed the "Blue Route":

"August 22, Monday, 1938 — 5:20

"Source of *Mackenzie River*—east end of Big Island. Ducks beginning to show on Slave Lake. Many ducks around island and bays where grass appears. White-winged Scoters, Bluebills, Mallards — shallow waters, gravel bottom — aquatic vegetation plentiful — ducks on south ends of all islands — ducks all over wide part of river — mostly Mallards, some Widgeon. Water appears 1 to 2 feet deep, literally covered with ducks. 18 ducks per acre—patches of wide grassy shores as we go down river, some Mergansers, some broods too young to fly. One flock of Crows. Slave Lake gets shallow near mouth of Mackenzie with abundant aquatic vegetation showing with gravel bottom. Another flock of crows between mouth of Mackenzie and Hay River.

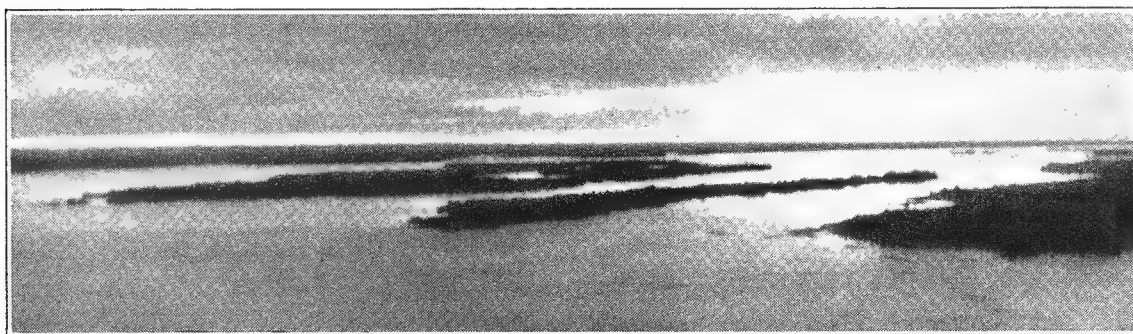
"6:09—Down at *Hay River*.

"Aug. 23—8:10—Took off from Hay River, east along Slave Lake to Buffalo River.

"8:25—South along *Buffalo River*—water in potholes on each side, indicates alkali or salt. No ducks. Fewer and smaller potholes—5 miles up to 10. At 10 miles number of small lakes appear on either side. All partly timbered to shore. Blue colored water and 50 per cent timbered. No ducks in lakes between Slave and Buffalo, until within three miles of Buffalo. Indians go into Buffalo Lake around September 1st — come out for Christmas. Go back after New Year's and remain until about June 1st.

"8:50 — *Buffalo Lake* — very shallow at source of river. Gravel shores, with grass about 100 feet to timber and bush. Ducks and geese in all bays: Pintails, Mallards, Teal, Bluebills, geese. One duck to 50 acres—1 goose to 200 acres. On north end of lake, shore turns to black sand for short way. Ducks plentiful at deltas of many rivers and creeks, where large mud flats are in evidence. Bluebills and Canadas in greatest abundance. Most of ducks on southwest side of lake. Country between Buffalo and Copp Lakes all muskeg.

"9:45—*Copp Lake*—shallow, timbered to shore line; gravel shores; plenty of grass along shore. Golden-eye, Scaup. No ducks on south shore, all on west so far, now on east shore. One duck per 2 acres. All diving ducks. Lakes (unnamed) between Copp and Buffalo River, same as Copp."



Source of the mighty Mackenzie River — Great Slave Lake. This great river empties into the Arctic Sea through a vast delta, where myriads of waterfowl breed.

Chapter Five

MAPS, TABULATIONS AND
STATISTICS

In this chapter you will find the condensed tabulations compiled from the figures given on the census tally sheets.

Map No. 1 shows the three major geographical divisions: thirteen sub-divisions outlined for the purpose of showing duck distribution and the names and locations of twenty-nine completed D.U. projects which have improved or brought under development, approximately 650,000 acres of duck producing territory.

Table No. I. gives the duck population of the thirteen sub-divisions mentioned above for each census year so that direct comparison can be made. Percentage increases are given.

Table II. shows the duck population and percent of total found in the agricultural belt and Northland and the further sub-division of the total into the three major geographical zones.

Table III. shows the duck population by species and provinces as reported by our Keemen and biologists. Three census years are covered for comparison.

Map No. 2 shows distribution of duck population by sectional map sheet.

Table IV. gives the brood totals and averages for each species for the three census years. The total brood average shows little variation from year to year.

Table V. gives the brood totals and averages by species for Manitoba only. The 1935 figures were not analysed by province so only the 1938 and 1939 figures are available for comparison.

Table VI. gives the same details for Saskatchewan.

Table VII. gives the same details for Alberta.

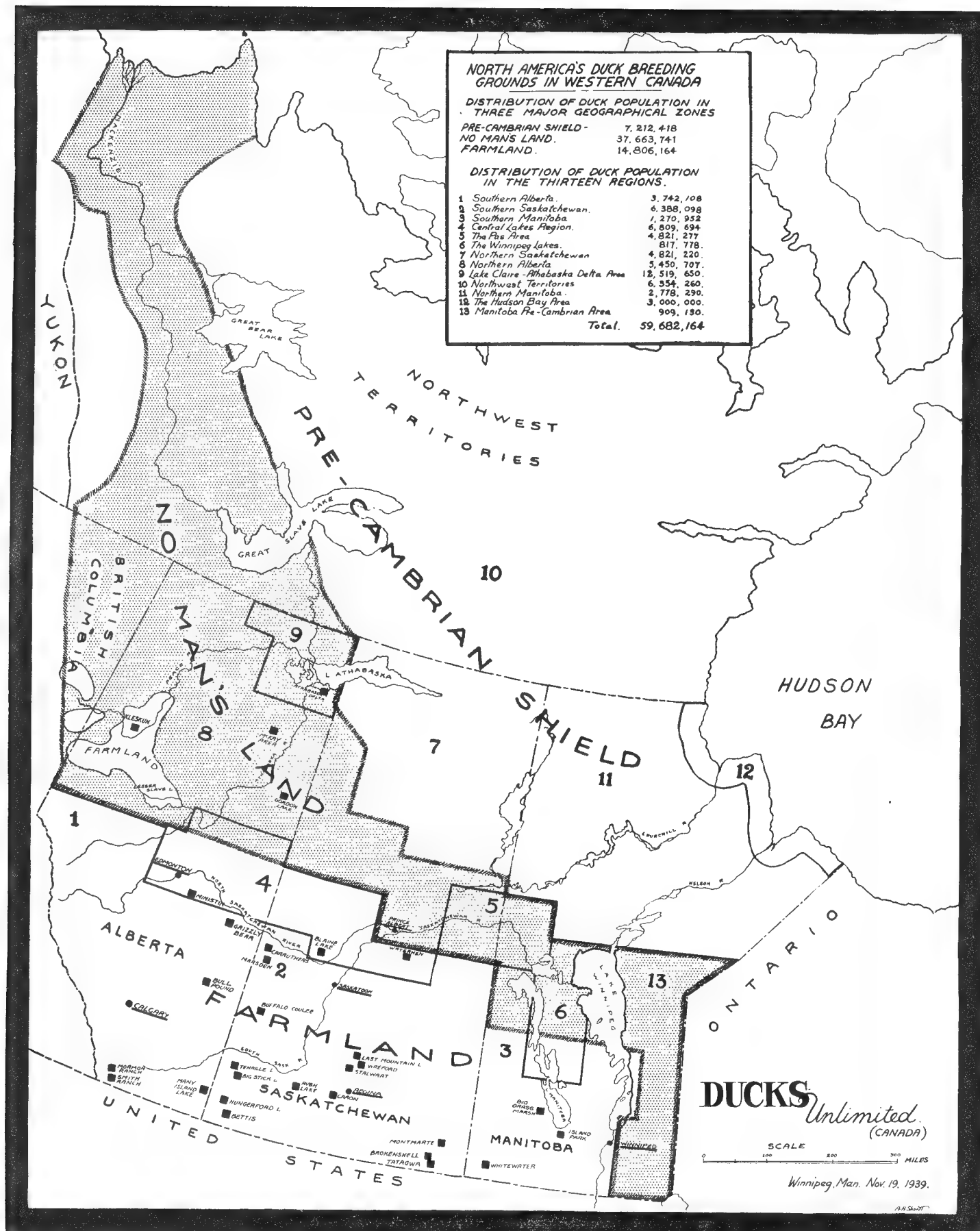
Table I—Summary of Duck Population

	1939	1938	1935
1. Alberta — Southern Section	3,742,108	3,500,000	1,600,000
2. Saskatchewan — Southern Section	6,388,098	2,000,000	2,400,000
3. Manitoba — Southern Section	1,270,952	1,940,000	1,400,000
4. Central Lake Area — Alta., Sask.	6,809,694	5,366,000	10,900,000
5. The Pas Area	4,821,272	3,900,000	3,500,000
6. Winnipeg Lakes Area	817,778	1,550,000	2,200,000
7. Northern Saskatchewan	4,821,220	3,645,000	3,800,000
8. Northern Alberta (N. of 53° and Central Lakes Area—exclusive of No. 9)	5,450,707	6,850,000	5,500,000
9. Alberta—Lake Claire & Athabaska Delta and portion of Wood Buffalo Park	12,519,650	8,000,000	900,000
10. Northwest Territories (Inc. portions of Wood Buffalo Park, Mackenzie and Slave River) ...	6,354,260	5,000,000	7,300,000
11. Northern Manitoba (exclusive of the Hudson Bay Area)	2,778,290	3,165,000	1,000,000
12. The Hudson Bay Area	3,000,000	2,678,000	
13. Manitoba Pre-Cambrian Area, south of 54° . .	909,130	1,450,000	
Totals	59,682,164	49,044,000	40,500,000

Increase in population in 1938 over 1935, 21.1%

Increase in population in 1939 over 1938, 21.7%

Increase in population in 1939 over 1935, 47.4%



Numbered areas correspond to regions named in population table on page 17.
Black squares show location of D.U. projects, completed or underway.

**Table II—Distribution of Duck Population in Northland, Farmland
and further sub-divided into three major geographical zones.**

	1939	%	1938	%	1935	%
1. & 2. Northland	44,876,159	75.2	38,921,000	79.4	29,650,000	73.3
3. Farmland	14,806,005	24.8	10,123,000	20.6	10,850,000	26.7
Total	59,682,164		49,044,000		40,500,000	
1. No Man's Land	37,663,741	63.1	32,661,000	66.4	24,170,000	60.9
2. Pre-Cambrian Shield	7,212,418	12.1	6,260,000	13.0	5,040,000	12.4
3. Farmland	14,806,164	24.8	10,123,000	20.6	10,850,000	26.7
Total	59,682,164		49,044,000		40,500,000	



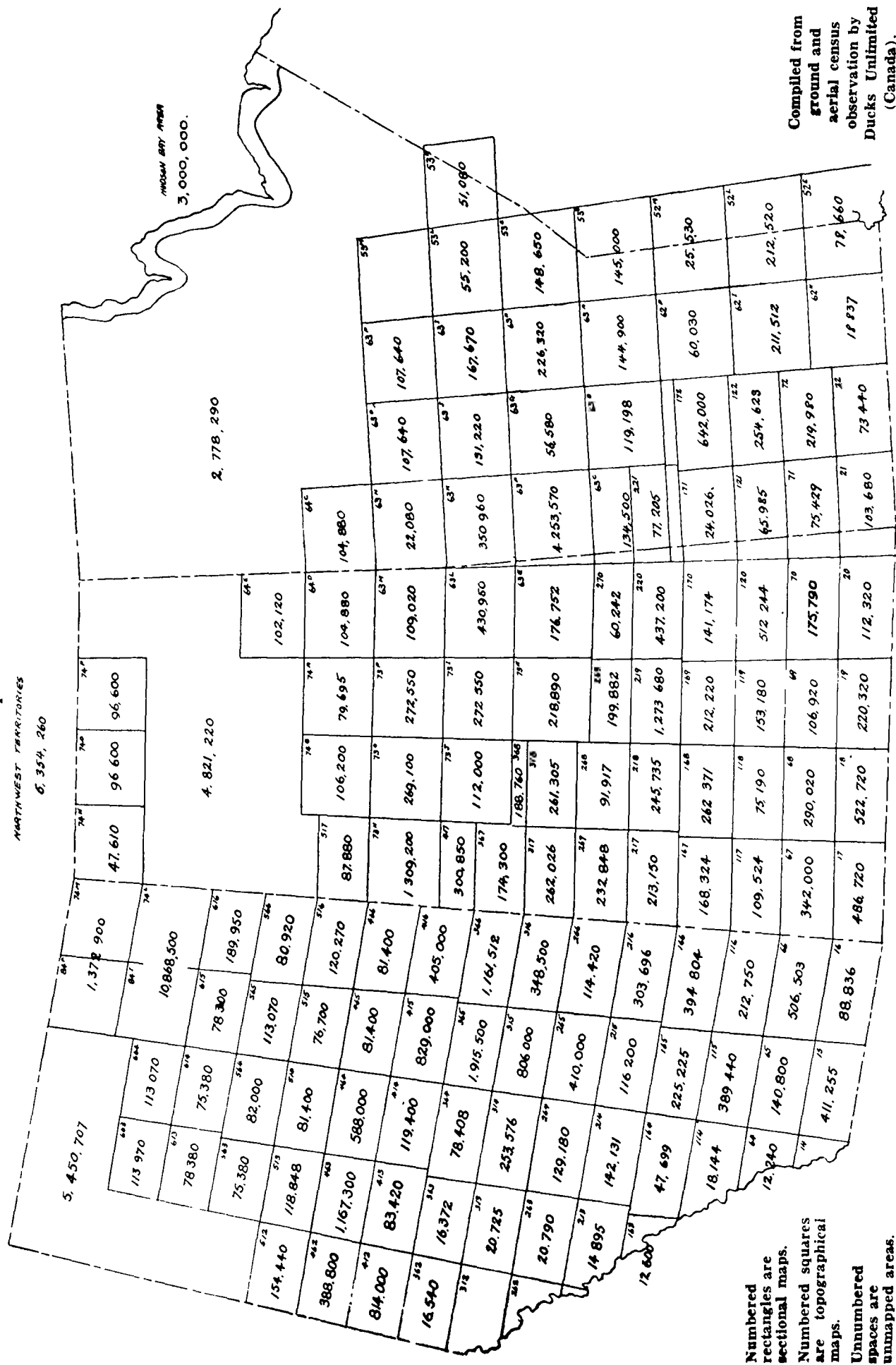
Salvaging drought-stricken goslings and geese at Many Island Lake in July, 1938. Hundreds of ducks were trucked to permanent water; but thousands had perished, following the evaporation of the shallow ponds. Ducks Unlimited built a big dam; stored deep, permanent water in 1939, and raised many thousands of ducks and geese here.

Table III—Duck Population by Species and Provinces

SPECIES	MANITOBA			SASKATCHEWAN			ALBERTA		
	1939	1938	1935	1939	1938	1935	1939	1938	1935
Mallard	81,010	17,305	31,196	158,191	68,851	56,038	178,165	260,783	176,825
Pintail	38,390	17,919	20,238	104,748	35,524	12,055	50,057	43,555	68,421
Shoveller	16,821	19,795	11,529	31,861	13,811	5,341	27,363	52,514	15,598
Baldpate	2,800	874	8,961	15,758	1,529	399	3,154	13,009	3,641
Gadwall	1,588	1,393		16,767	6,993		2,858	11,266	3,102
Blue-winged Teal	27,968	13,780		45,356	2,129		30,413	17,619	
Green-winged Teal	2,141	448		41,199	790		24,723	16,130	
Teals (unidentified)									
Black Duck	48	17,405	16,092		19,887	15,505	9,203	39,180	
Wood Duck		479			54				
Redhead	20,288	2,757	9,111	21,039	1,879	79	2,784	2,063	2,808
Canvasback	34,220	8,996	11,482	26,857	9,165	5,282	10,622	45,177	18,949
Lesser Scaup	36,023	2,770	242	19,976	2,162	1,793	8,657	20,599	23,664
Ruddy Duck	9,622	597	242	3,053	543		315	295	48
Bufflehead	1,129	1,634	330	2,301	1,695	305	2,092	6,483	42,226
American Golden-eye	11,722	1,243	1,291	3,774	412	3,112	1,981	3,810	7,781
Scoters sp.	7,868	40		16,785	6,325	17	24,013	13,434	6,392
Ring-necked Duck	50	11		1,253			154	64	
Merganser sp.							602	114	
TOTALS	291,988	137,446	111,014	508,918	171,776	99,926	377,456	546,095	369,455

This table gives the totals for each species as reported by our Kee-men. The figures for each species are not comparable for determining the rate of increase or decrease. In 1939 for instance the identification of species was greatly increased by tabulation of our own biologists. As the majority of returns come from the Farmland belt and are taken during the breeding season, such species as Mergansers, Golden-eyes, Scoters, etc., whose ranges lie chiefly north of the farmlands, are poorly represented or absent.

NORTHWEST TERRITORIES



**Compiled from
ground and
aerial census
observation by
Ducks Unlimited
(Canada).**

Numbered rectangles are sectional maps.
Numbered squares are topographical maps.
Unnumbered spaces are unmappped areas.

MANITOBA

SASKATCHEWAN

ALBERTA

1939 Distribution of Duck population in Western Canada

Table IV — Brood Total and Averages Per Species — 1939, 1938, 1935.

SPECIES	1939			1938			1935		
	Females with Broods	Total No. Young	Ave Brood	Females with Broods	Total No. Young	Ave Brood	Females with Broods	Total No. Young	Ave. Brood
1. Mallard	42,452	251,825	5.93	36,711	257,869	7.02	48,110	284,025	5.90
2. Pintail	17,237	103,963	6.03	10,379	60,168	5.7	11,618	93,380	6.37
3. Shoveller	6,222	35,916	5.77	10,206	60,560	5.8	7,421	48,185	6.49
4. Baldpate	3,197	17,075	5.31	1,669	10,297	6.1	1,682	10,628	6.32
5. Gadwall	2,155	15,235	7.07	2,212	11,806	6.67	1,251	7,869	6.29
6. Blue-winged Teal	7,237	52,906	7.31	3,525	23,728	6.7			
7. Green-winged Teal	5,818	14,610	7.67	1,599	12,013	7.5			
8. Teals (unidentified)	3,183	19,571	6.11	9,889	55,142	5.5	25,321	148,739	5.87
9. Black Duck	22	135	6.83	39	351	9.07			
10. Redhead	3,293	19,139	5.9	695	1,117	5.9	2,028	11,742	5.79
11. Canvasback	5,198	31,068	5.97	5,932	33,439	5.6	5,910	28,357	4.79
12. Lesser Scaup	3,133	12,882	4.11	2,248	15,016	6.6	5,746	11,010	7.14
13. Ruddy Duck	222	1,001	4.52	175	960	5.1	211	1,182	5.6
14. Bufflehead	181	2,421	5.04	1,362	7,566	5.7	5,135	30,784	5.99
15. American Golden-eye	175	2,115	5.15	804	1,125	5.1	771	5,037	6.53
16. Mergansers	87	472	5.1	430	3,099				
17. Ring-necked Duck	159	565	3.61	8	19	6.1			
18. Unidentified	12,292	62,698	5.10	13,960	55,385	3.97	32,575	188,699	5.8
19. Scoters (unidentified)	1,550	7,965	5.11	1,145	6,802	5.93	827	4,285	5.18
TOTALS	114,432	682,277	5.96	102,991	623,795	6.05	151,699	903,922	5.96

This table gives the combined totals of females and their broods by species and the average for each, as reported by our Kee-men and Biologists.

Table V—Brood Totals and Averages for Manitoba.

SPECIES	1939			1938			1935		
	Females with Broods	Total No. Young	Ave. Brood	Females with Broods	Total No. Young	Ave. Brood	Females with Broods	Total No. Young	Ave. Brood
1. Mallard	2,651	15,891	5.99	5,708	30,375	5.32			
2. Pintail	1,360	8,022	5.9	2,159	11,739	5.43			
3. Shoveller	861	5,103	5.92	1,858	14,245	7.66			
4. Baldpate	84	564	6.71	101	652	6.45			
5. Gadwall	125	782	6.25	106	821	7.74			
6. Blue-winged Teal	1,102	7,361	6.67	1,642	9,726	5.92			
7. Green-winged Teal	212	1,387	6.54	63	363	5.76			
8. Teals (unidentified)	388	2,259	5.82	2,471	11,639	4.71			
9. Black Duck	22	135	6.13	50	425	8.5			
10. Redhead	315	2,410	7.65	271	1,653	6.09			
11. Canvasback	682	1,198	6.15	909	6,296	6.92			
12. Lesser Scaup	56	400	7.14	247	1,861	7.13			
13. Ruddy Duck	25	155	6.20	71	419	5.90			
14. Bufflehead	23	144	6.26	248	1,371	5.52			
15. American Golden-eye	32	278	8.68	191	1,013	5.16			
16. Scoters	4	31	7.7						
17. Mergansers	5	41	8.2						
18. Ring-necked Duck	4	25	6.25						
19. Unidentified	230	1,606	6.98	3,291	7,055				
TOTALS	8,181	50,792	6.08	19,389	99,683	5.11	11,750	86,064	5.83

This table shows the comparative hatch by species in Manitoba only. The years 1939 and 1938 are comparable, but only totals are available for 1935.

Table VI—Brood Totals and Averages for Saskatchewan.

SPECIES	1939			1938			1935		
	Females with Broods	Total No. Young	Ave. Brood	Females with Broods	Total No. Young	Ave. Brood	Females with Broods	Total No. Young	Ave. Brood
1. Mallard	18,489	123,914	6.70	7,746	48,663	6.26			
2. Pintail	11,750	73,274	6.23	4,054	23,707	5.6			
3. Shoveller	3,355	18,996	5.66	1,886	10,414	5.52			
4. Baldpate	2,768	14,796	5.30	163	1,091	6.71			
5. Gadwall	1,762	12,765	7.24	746	5,309	7.11			
6. Blue-winged Teal	4,214	35,241	8.36	252	1,605	6.33			
7. Green-winged Teal	4,250	34,476	8.11	71	518	7.3			
8. Teal (unidentified)	1,842	11,755	6.38	2,773	14,655	5.28			
9. Black Duck				2	14	7.0			
10. Wood Duck				3	21	7.0			
11. Redhead	2,187	13,569	6.2	208	1,243	5.97			
12. Canvasback	3,236	19,994	6.15	1,157	6,263	5.11			
13. Lesser Scaup	2,556	9,299	3.63	198	1,457	7.38			
14. Ruddy Duck	192	811	4.22	62	311	5.01			
15. Bufflehead	264	1,227	4.64	251	1,303	5.19			
16. American Golden-eye	283	1,101	3.8	51	283	5.55			
17. Scoters	17	438	9.32	319	1,890	5.92			
18. Ring-necked Duck	148	502	3.4						
19. Unidentified	5,210	26,930	5.14	3,321	18,065	5.13			
20. Mergansers	1	4	4.0	1	1	1.0			
TOTALS	62,695	400,162	6.38	23,261	136,819	5.88	19,568	98,967	5.06

This table shows the comparative hatch by species in Saskatchewan only. The years 1939 and 1938 are comparable but only totals are available for 1935

Table VII—Brood Totals and Averages for Alberta.

SPECIES	1939			1938			1935		
	Females with Broods	Total Young	Ave. Brood	Females with Broods	Total Young	Ave. Brood	Females with Broods	Total Young	Ave. Brood
1. Mallard	19,330	101,772	5.26	23,340	178,831	7.66			
2. Pintail	4,167	23,325	5.59	4,066	24,712	6.07			
3. Shoveller	1,993	11,656	5.85	6,462	35,901	5.40			
4. Baldpate	343	1,695	4.94	1,407	8,551	6.07			
5. Gadwall	268	1,488	5.36	1,360	8,626	6.34			
6. Blue-winged Teal	1,613	10,299	6.38	1,631	12,397	7.60			
7. Green-winged Teal	1,266	8,803	6.95	1,465	11,132	7.59			
8. Teals (unidentified)	964	5,606	5.81	4,745	29,148	6.14			
9. Redhead	520	1,895	3.64	220	1,229	5.58			
10. Canvasback	1,280	6,882	5.37	4,775	27,186	5.71			
11. Lesser Scaup	472	2,855	6.05	1,830	11,908	6.50			
12. Ruddy Duck	6	45	7.5	42	230	5.47			
13. Bufflehead	194	1,033	5.32	863	4,892	5.6			
14. American Golden-eye	137	897	6.55	559	2,778	4.96			
15. Scoters	1,096	6,517	5.94	821	5,059	6.16			
16. Ring-necked Duck	7	38	5.43	8	49	6.01			
17. Unidentified	6,056	28,167	4.65	7,382	40,440	5.47			
18. Mergansers	78	397	5.09	11	100	9.09			
TOTALS	39,789	213,370	5.36	60,987	403,169	6.61	51,673	300,684	5.82

This table shows the comparative hatch by species in Alberta only. The years 1939 and 1938 are comparable, but only totals are available for 1935

Chapter Six

DISTRIBUTION OF
BREEDING DUCKS

The outstanding revelation of the Ducks Unlimited census work is that, whereas over 80% of North America's ducks are raised in the Canadian West, the bulk of that production comes from the strip of territory which we call "No Man's Land" or the "Northland" (See Map on page 18). Analysis of census figures reveals the following percentages of the duck population distributed over the three major geographical environmental zones:

	1939	1938	1935
	%	%	%
Farmland	24.81	20.6	26.7
No Man's Land	63.1	66.4	60.9
Pre-Cambrian Shield	12.09	13.0	12.4

**"No Man's Land" —
The Northland**

"No Man's Land" may be concisely described as a region of lakes, forest and muskegs—with few inhabitants. In many ways, conditions remain today as primitive as before the white man's day; but with the increased intrusion by airplane, road construction, mining, trapping and commercial fishing, of recent years the deterioration has become marked—and is accelerating. In spite of the fact that vast areas still remain within this belt in all the pristine beauty of its primitive condition, still vaster areas have been virtually destroyed, so far as waterfowl production is concerned, by unrestricted trapping of beaver in years past, and by forest and marsh fires. Anyone who has flown over this area cannot fail to be astonished that so few people could do such great damage to such a vast area in such a short period of time.

At one time the spaces of this far expanse teemed with big game and smaller fur-bearing animals—as well as wildfowl. Its wildlife has been decimated; and, today, is scarce over practically the entire region. The old story of wasteful, uncontrolled exploitation—over-shooting and over-trapping—has been a first step in destroying the once almost unlimited wildlife assets of this vast region. The slaughter of beaver, the break-up of their storage dams, drought and fire have followed in quick and destructive succession; and have depopulated this "No Man's Land" of all but a fraction of the wildlife which once found food and shelter in its vast freedom. A few more years of uncontrolled runoff and fire, and the last vestiges of the great heritage of wildlife left to Canadians in this former "Happy Hunting Ground" may be obliterated.



In the Central Lake region fires blast forest, muskeg and shoreline — nests, food and cover.

**To Restore The
"Happy Hunting Ground"**

Belated efforts are now being made to restore the beaver to areas from which, in a short generation, they had been exterminated. Forest fires continue to increase and become more destructive because, through the loss of the beaver, their dams failed and thousands of marshes, ponds and muskegs, which existed only by virtue of the work of these busy engineers, dried up. Thus, instead of being barriers to fire, they became added fuel; and carried the flames to areas which might otherwise have escaped.

This "No Man's Land" is the last stronghold of the ducks. In years past it almost certainly produced more ducks than it does today. It can be saved from further deterioration. It can be restored—to produce untold wealth in fur, fish and feather. But, this can only be done by planned management

**Managed Blocks
For Restoration**

Planned management, to restore and increase crops of wildlife which but serve the needs of mankind, includes sane control of undesired predators which (like noxious weeds on a farm) threaten the crop with damage or destruction.

For instance, where crows crowd into a duck marsh in such numbers that their predations unduly reduce the crop of ducks and other use-

ful birds, management takes measures to control the situation and "weed out" the surplus crows.

Further, surveys carried out during 1939 by Ducks Unlimited yield evidence that in certain waters and marshlands (like those of the Saskatchewan River Delta and others in northern Alberta) jackfish are even more destructive predators than crows. Observations disclosed that on one 60,000-acre area, these submarine killers devoured 180,000 ducklings — and an unknown number of young muskrats; to say nothing of other more marketable fish. It is estimated that, in certain marshes, where ducks nest in heavy concentrations, jackfish devour 25% to 40% of the total hatch. To meet this menace, methods are being worked out to control excessive numbers of jackfish — thus increasing production of more valuable fish, of fur, and of waterfowl.

Distribution of Ducks in "No Man's Land"

The Northern edge of "No Man's Land" changes abruptly to the rocky, deep-water lake country typical of the Pre-Cambrian shield. The southern borderline is less definite, merging gradually from parklands to densely forested muskeg, shallow-lake country. Agricultural activities intrude into it at a number of points, chiefly along extensions of the railway, like fingers reaching into the northland.

More than 60% of recorded duck population is found in No Man's Land. Nearly half of this is found in two densely populated areas—The Athabaska Delta - Lake Claire - Wood Buffalo Park region, in Northern Alberta; and The Pas-Cumberland Lake region, in west-central Manitoba and east-central Saskatchewan. These two areas are compact duck production plants of approximately 24,000 and 16,000 square miles respectively.

A more scattered, but highly productive waterfowl area is the central lakes region of



Dr. Geo. Saunders, U.S. Biological Survey (with D.U. census plane) examines vast tonnage of Coontail and Duck Weed on Northland lake.

central Saskatchewan and east-central Alberta. This is an area of roughly, 48,000 square miles, lying partly in the agricultural belt and partly in "No Man's Land." The great marshes at the source of the Mackenzie River at the southwest end of Great Slave Lake are likewise important, and there are several very productive areas of smaller size, here and there, throughout "No Man's Land." From this strip of territory come most of the diving ducks.

Ducks Over the Farmland

What is now the agricultural belt of the Canadian West probably produced more waterfowl than any other part of their breeding ranges, before the face of nature was changed by the plow. The longer breeding season, abundance of natural foods and innumerable small shallow waters, provided ideal conditions especially for the pond ducks. In this area the duck decline has been precipitous due to loss of water areas, nesting cover and hunting pressure. Since 1930, drought has taken a heavy toll of adult and young; has been a major factor in the decline; and is suspected, also, as being partly responsible for the unbalanced sex ratio which has been observed on both the wintering and breeding grounds.

Duck Population Shifts

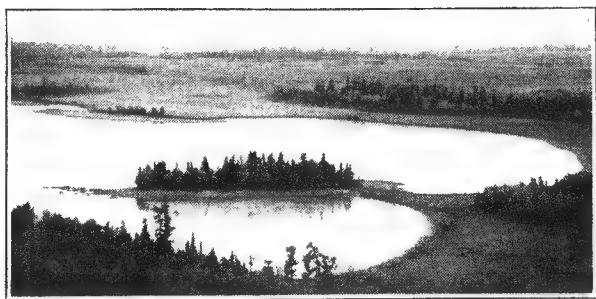
Large-scale movements of breeding waterfowl, under changed conditions from year to year, have already become evident. For instance, in 1935, the Lake Claire-Athabaska Delta region was in flood. Only the tree-tops along the creek banks showed above water. The duck population was computed at 900,000.

Seen again in 1938, water levels were down; and the whole area was in ideal condition for breeding waterfowl. That year, the duck population was computed at eight million. On the other hand, the population in the Central Lakes region, in 1935, was computed at 10,900,000. In 1938 it was less than half that total. This indicates a major shift in the breeding population.

Again, in Manitoba, the water levels in Lakes Manitoba, Winnipegosis and Waterhen (famous breeding grounds of the Canvasback) have steadily declined — with a corresponding reduction in the waterfowl estimate. Comparable increases have occurred in The Pas area, to the north.

More Water—More Ducks— on the Prairies

In 1939, surface water conditions in southern Saskatchewan showed great improvement over the previous nine years. Ducks flocked back to former breeding grounds, which had been out of commission for nearly a decade.



Countless such Northland lakes are veritable duck factories. Many are rapidly shrinking—because of drought, fire and destruction of beaver.

Water lasted through until the young were on the wing; and, in consequence, the duck count jumped from two millions in 1938 to nearly six and a half millions in 1939. Most of this increase was offspring—as, in this area, for eight long years, the majority of ducklings had died through water drying up before the hatch was on the wing.

In Manitoba, surface water conditions were not restored at all in 1939; and the duck population dropped by 670,000, compared with 1938. It is probable that many breeding birds moved into Saskatchewan to take advantage of the restored water conditions in that province.

What About Flock Movements?

There is some evidence from banding records—meagre as yet—that young ducklings move north after the hatching season and mature far from the places at which they were hatched. However, there is too little evidence as yet to make any definite statements about this. Enough has been said to show that the duck population moves from place to place in response to changed conditions.

Other movements of ducks, about which we know very little, are the flock movements of males and young after the breeding season. In August, when the aerial survey is made, we come upon huge concentrations of ducks in relatively small areas. So many, in fact, that the question of food must be acute. It is probable that abundant food supplies determine these concentration points; but from how large an area, or from what distance the ducks foregather, we do not know. Ducks observed during

the breeding season, before the hatch appears, in the Athabaska Delta, are but a fraction of the huge numbers seen in August, even allowing for a threefold increase due to progeny.

A Typical Duck Hotel

McCallum Lake in Northern Saskatchewan (about 11,500 acres) held about 350,000 ducks. About 80% were Scaup (Bluebills) and there were many Canvasbacks and Redheads. We quote from the log of the aerial party which surveyed this lake in 1939: "Thousands of ducks take to wing. Many more swim off into the bulrushes as we hit the water. We circle the lake twice; and land in the south-east bay. Ducks 25 per acre over the entire lake surface. Flocks of 500, 1000, 3000, 2000, and 2000 sheltered behind points covered with timber; and in countless bays carpeted with bulrush. In many bays, 50 to acre. Lake bottom and beach clear sand. Shore loaded for hundreds of yards — a hundred feet wide — with a vast tonnage of coontail and duckweed (*Lemna trisulca*) washed up by waves." The ducks which did not take to wing would be, in most cases, in the flightless period of the post-nuptial moult.

In this respect the discovery of thousands of flightless Canvasbacks, Redheads and Lesser Scaup on Swan Lake and Kavinaw Lake, in Manitoba, and in Boulanger Lake in Manitoba—Saskatchewan, throws some light on the movements of these species, immediately following the breeding season. All these lakes are of the deep water type, heavily timbered to the shores. The flightless birds were rafted for miles about a quarter of a mile offshore. They invariably dived at the approach of the plane. These secluded lakes were miles away from their known breeding grounds. It was evident that they had gathered together—mostly males—to go through the flightless period of the moult.

These observations were made on August 14, 15, and 17, 1939. The disappearance of male diving ducks has been noted in July on Big Grass Marsh in Manitoba; at Delta (Lake Manitoba Marshes) and at Waterhen Marsh (Saskatchewan) males were almost absent from the Waterhen-Winnipegosis breeding grounds in August.

The importance of the above observations is that the huge concentrations of ducks in certain areas does not necessarily mean that they were all raised there, or even in the immediate vicinity.

Chapter Seven

CAUSES OF LOSS
OF WATERFOWL

Losses of waterfowl population are due to a variety of causes; including the following:

1. Disappearance of former breeding grounds, due to drainage, agriculture, drought and extermination of beaver.
2. Water drying up at hatching time.
3. Predators: Crows, magpies, jackfish, skunks and humans.
4. Fires: Marsh, muskeg and forest.
5. Over-haying and over-grazing.
6. Over-cultivation.
7. Weather, floods and drought.
8. Over-shooting.
9. Disease.

Ducks Face Hazards
In The Farmlands

The importance of any of the above factors varies with locality. For instance, the duck population of the Farmlands has been decimated by drainage, water drying up at hatching time, crows, magpies, skunks, humans, fires, haying and grazing, and farm operations. This combination has been too much for them, with the result that most of their former breeding grounds have disappeared entirely — or have deteriorated to a greater, or lesser, extent. Only creation of permanent waters in key positions and, where feasible, restoration and management of former breeding grounds; control of the other factors; and sympathetic co-operation by the men on the ground, can save and increase the waterfowl and other useful wildlife in this area.



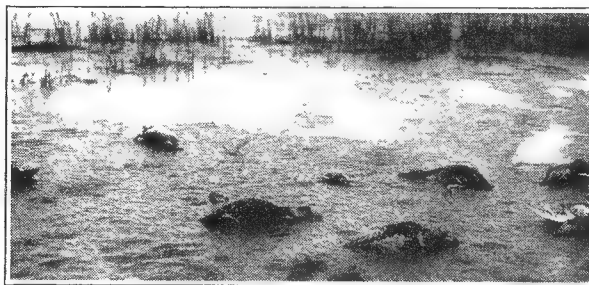
A canoe-load of disease-killed ducks. D.U. men were on the job to clean up the infested marsh as soon as outbreak was reported.

“No Man’s Land”

Duck Losses

In “No Man’s Land,” the losses are chiefly due to extermination of the beaver; to muskeg, marsh and forest fires; to jackfish and human predation; and to fluctuating water levels. Steady deterioration of this area can only be checked by restoration of beaver; better control of fires; control of jackfish and human predators; and stabilization of water levels.

A comprehensive, long range, planned economy is needed to restore this last great breeding ground of ducks to its former usefulness as a producer of wildlife crops.

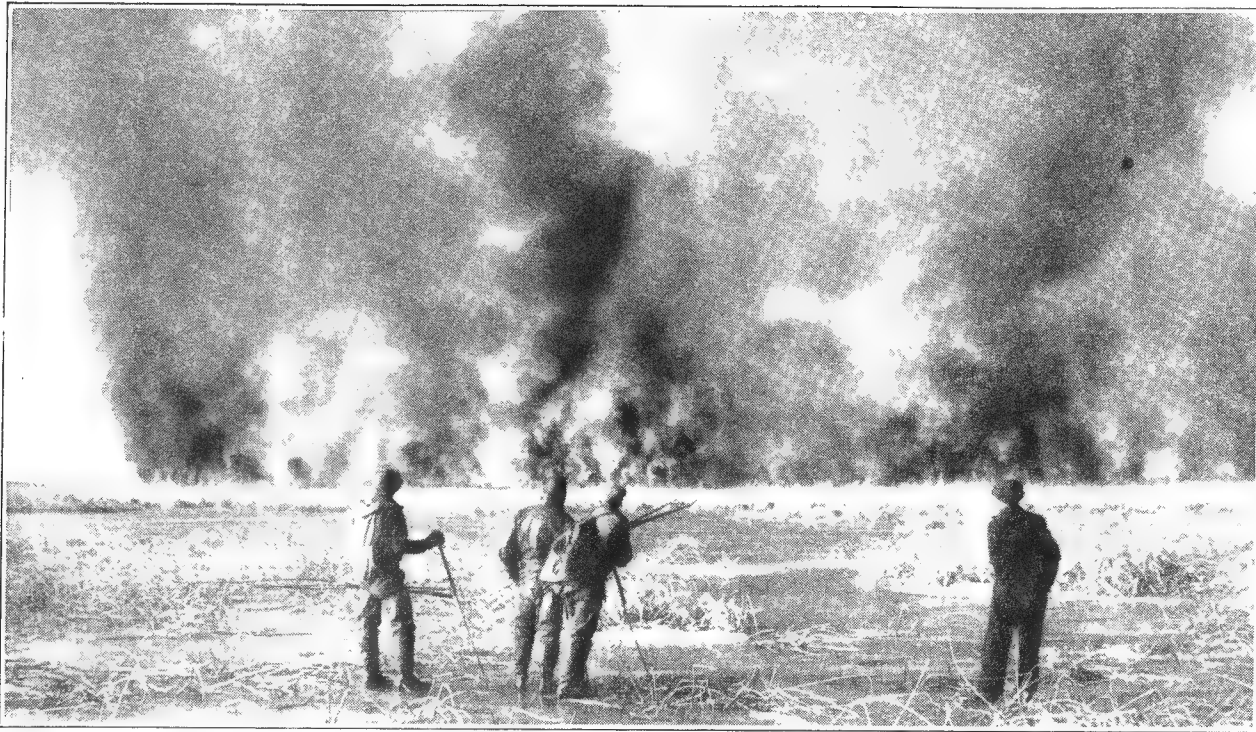


Disease leaves a litter of dead birds. Outbreaks should be reported to D.U.

Scattered Ducks in
Pre-Cambrian Area

The surface area of the Pre-Cambrian shield is as great as the other two areas combined. It produced a lot of ducks; but there are no great concentrated breeding grounds, so far as we know. Not very much is known about the distribution of waterfowl in this uninhabited area; but it is known that its characteristic lakes are deep, cold and rock-bound. Muskegs — mostly spruce bogs — alternating with rocky outcrops covered sparsely with jack-pine, extend over most of the area.

Such country is not suitable for duck breeding, except to a limited extent for such species as Mergansers (sawbills or fish ducks); Golden-eyes and Buffleheads (tree-nesting ducks)—none of which are very important from the sporting viewpoint. There are limited areas of marsh in bays of some lakes and at the deltas of some of the rivers. In such suitable places, Mallards, Pintails, Baldpates, Green-winged Teal, Scaups and Ring-necked ducks are to be found. The factors causing losses are unknown; but jackfish are probably serious predators.



This fire blackened a big Manitoba marsh in the early spring. Marshland fires destroy countless ducks' nests; and ruin vast expanses for duck nesting (to say nothing of ruining fur production).

Chapter Eight

THE RESTORATION PROGRAMME

In a nutshell, Ducks Unlimited's programme is to restore former breeding grounds wherever possible; protect existing ones from destruction and manage the areas, with a view to obtaining maximum waterfowl production.

The restoration of former breeding grounds is accomplished by impounding water behind dams and dykes; by stream diversion; by deepening of sloughs and potholes; by dugouts; by ditching to connect groups of potholes to ensure survival of a key pond; and by provision of "duckouts", by dynamite or dragline, in the beds of large, shallow lakes—to ensure permanent water in dry seasons. Fencing of projects to protect nesting cover from over-grazing and trampling by cattle; fire-guarding and control to reduce the fire hazard and protect food and nesting cover; predator control on the duck breeding grounds; and planting of duck foods where necessary — these are all vital parts of the programme of restoration.

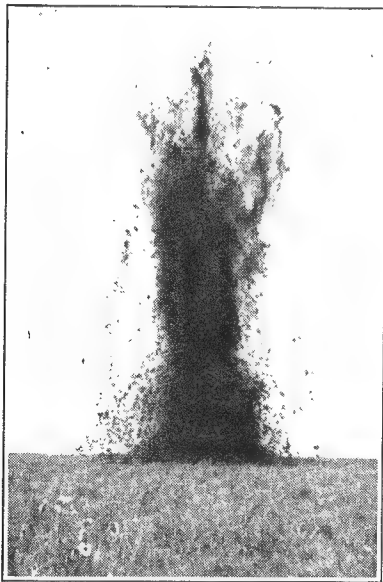
Protection of good breeding grounds entails construction of dams to stabilize water levels; fire fighting; predator control; and marsh management.

Vital Work of Kee-men

Prominent in the restoration programme is the dissemination of information to thousands of interested sportsmen, farmers, ranchers and other people who have the welfare of wildlife at heart and desire to help in the great work. This is done by means of pamphlets, radio broadcasts, illustrated articles in magazines and newspapers, illustrated lectures, moving pictures and publications such as this.

The actual foundation of our restoration work is our D.U. Kee-man organization — of which you are a member. You keep us informed of conditions in your own district; suggest projects and methods to us; advise us when salvage of drought stranded ducklings is necessary; report disease outbreaks; and, by your interest and example influence your neighbours to undertake the care of small water areas, protect the useful wildlife thereon and respect regulations governing hunting privileges.

Your leadership in your Community inspires undertakings to conserve water and wildlife, to the benefit of all concerned. Your contribution



Left — A "blowout" in a dried out lake bed.



Above—The resulting "duck-out" that will hold water next season.

of time and thought, in preparing the answers to our spring and fall questionnaires, in making the annual duck census in July, and advising us from time to time, when conditions change for better or worse, is the basis upon which our work is planned. When all your reports are brought together, we have a better picture of waterfowl conditions in Western Canada than anyone has ever had before.

You are doing a real service to your Community, to your country, to this continent and to wildlife restoration.

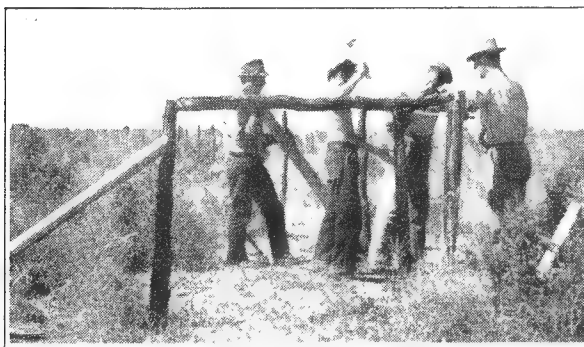
D. U. Project Management

The large D.U. restoration projects are planned and constructed by competent engineers; and managed by trained ecologists, assisted by local Kee-men and farmers. Water levels are manipulated, fences are built, grazing and haying are controlled—to give the best results to farmers, livestock breeders and wildlife. Fires are fought and prevented, food and cover plants are introduced, controlled or eliminated as the best land utilization dictates; and wild-

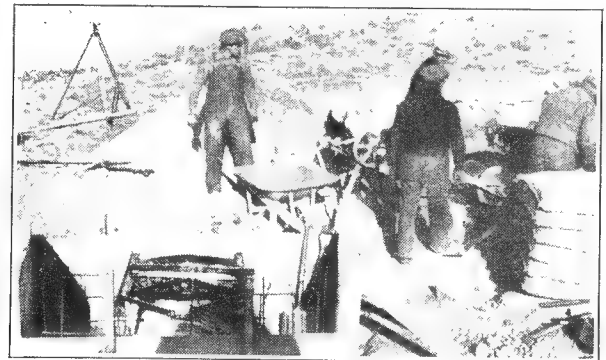
life is protected all through the year (if the project is a sanctuary) or throughout the production season (if it is open to hunting in the fall). Crows, magpies, skunks and jackfish are controlled if they become too numerous; and, in short, all those things are done which will improve marsh areas for waterfowl and other useful wildlife and provide permanent water for stock, irrigation and conservation purposes.

Banding of waterfowl is carried on; and research is directed along lines which will improve management technique and increase our knowledge of the movements and requirements of waterfowl on their breeding grounds.

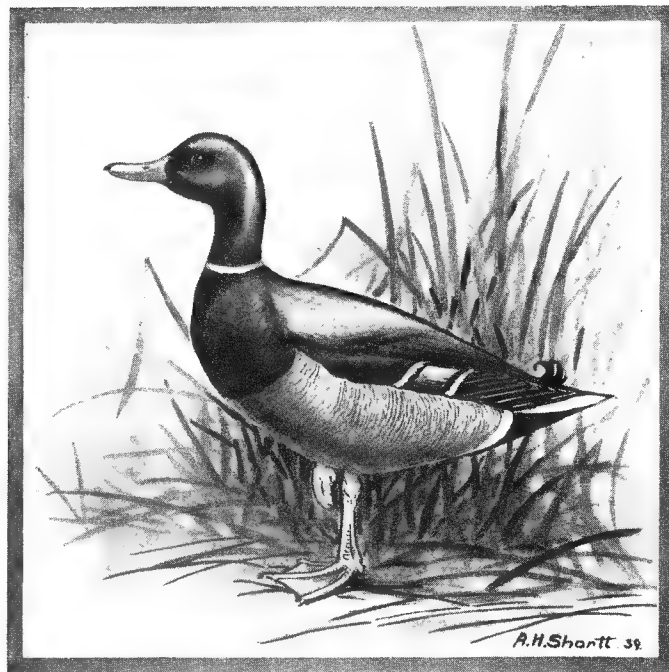
All this because you and we are sure that, in the light of our past experience, a land that is fit for wildlife to live and thrive in is a land in which we, too, can find happiness and prosperity. Together, that is what we are working to attain. The foundations are: surface water conservation; sane land utilization; and goodwill among men. Conservation, co-operation and restoration are the Kee-words. You are the Kee-men.



Fencing; to keep stock from miring in marshes.



Building concrete-and-steel culverts and controls in D.U. dam.



The Mallard — Daddy of them all.

GEESE AND SWANS

No. 1—WHISTLING SWAN
(*Cygnus columbianus*)

On the Water:

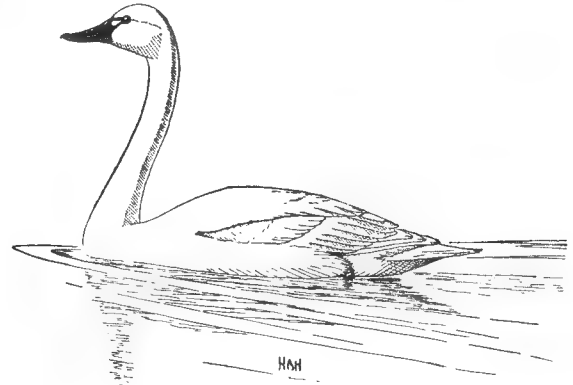
Sexes alike

Large size. All white. Long neck. Black bill. Close up, oval yellow spot at base of black bill.

In Flight:

Sexes alike

Large size. All white. Slow wing beats. Long neck carried straight out. Wings all white including tips. Black bill and feet. Loud bugling call notes.



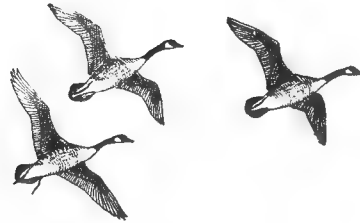
Whistling Swan
(*Cygnus columbianus*)
Wild Swan

No. 2—CANADA GOOSE
(*Branta canadensis*)

On the Water:

Sexes alike

Large size. Black head with white cheeks and throat. Black neck. White upper breast and under tail coverts. Black tail.



In Flight:

Sexes alike

Large grey bird with long neck. White "chin chucker" and white lower belly conspicuous. Above a conspicuous white "V" at base of tail shows plainly when birds are going away. Loud "honk".



Canada Goose
(*Branta canadensis*)
Grey Goose — Honker

Note: Several subspecies of *Branta canadensis* occur in Western Canada. Size constitutes the chief difference. The above field marks apply equally well to all forms except size. The following subspecies are found in Western Canada, chiefly as migrants through the southern portions.

1. Common Canada Goose (*Branta c. canadensis*) Largest prairie form.
2. Western Canada Goose (*Branta c. occidentalis*). Largest Pacific coast form.

3. Lesser Canada Goose (*Branta c. leucopareia*). Medium sized form. Also called Hutchin's Goose.
4. Richardson's Goose (*Branta c. hutchinsi*). No bigger than large mallard. Known in migration only in Manitoba. Breeds on islands in Hudson Bay.
5. Cackling Goose (*Branta c. minima*) Smallest form of all. Found on Pacific coast.

Taverner's nomenclature has been followed in compiling the above list.

No. 3—WHITE-FRONTED GOOSE

(Anser albifrons)

On the Water:

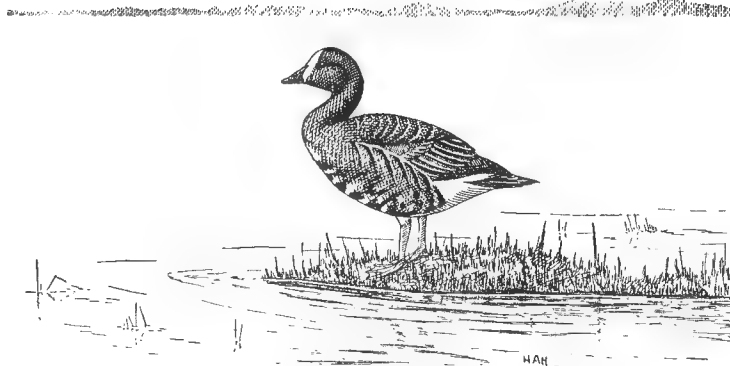
Sexes alike

Dark goose with white rear end.
White front of face.

In Flight:

Sexes alike

Very dark goose of medium size.
 Black cross bars (broken) on belly.
Yellow feet.



White-fronted Goose
(Anser albifrons)
 Brant, Speckle-belly

No. 4—LESSER SNOW GOOSE

(Chen hyperborea)

On the Water:

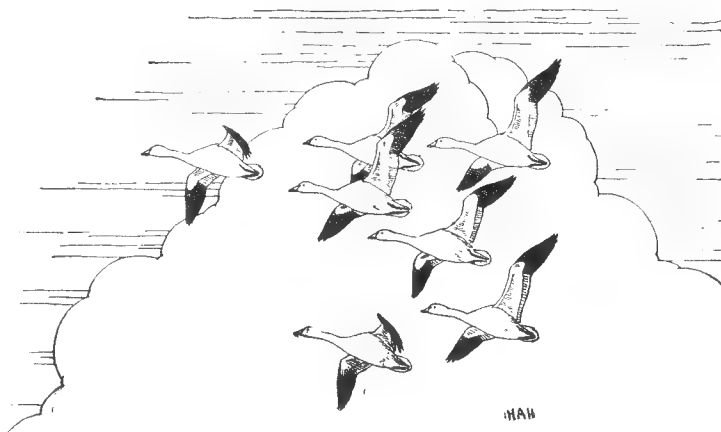
Sexes alike:

All white goose with black wing tips. Pink feet and pink bill.

In Flight:

Sexes alike:

Medium size. All white with black wing tips. High pitched cackling call.



Lesser Snow Goose
(Chen hyperborea)
 Wavey, White Wavey

No. 5—BLUE GOOSE

(Chen caerulescens)

On the Water:

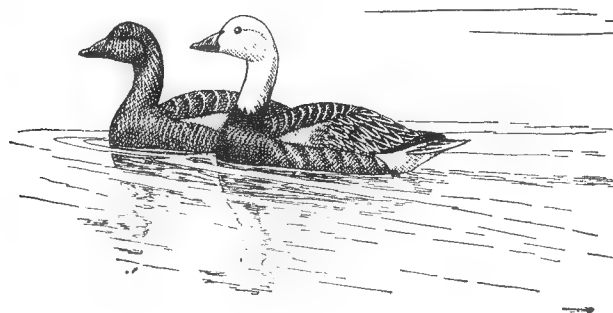
Sexes alike

Medium size. Dark bodied goose with *white head and neck*. Extent of white on neck very variable.

In Flight:

Sexes alike

Medium size. *Dark body and white head and neck*. Dark areas on underparts very variable. Some individuals almost white below. Underwing pattern all grey.



Immature — Adult
 Blue Goose
(Chen caerulescens)
 Blue Wavey

SURFACE FEEDING DUCKS

No. 6—MALLARD

(Anas platyrhynchos)

On the Water:

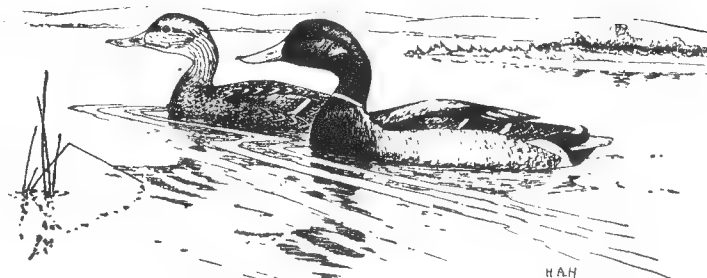
Male Rides high. Green head. *Narrow white collar around neck. Chestnut breast. Light grey above divided by dark stripe. Purplish-blue wing patch bordered fore and aft by white bars. Greenish bill.*

Female Rides high. General brownish mottled appearance. Wing patch same as male. Bill yellowish.

In Flight:

Male Heavy build. Large size. Head long — iridescent green. Wing patch shows *two narrow white bars*. Tail feathers white. Below — general greyish appearance with dark breast, greyish belly. *Pure white wing linings.*

Female Lacks green head but otherwise similar.



Common Mallard
(Anas platyrhynchos)
Greenhead, Wild Duck

No. 7—BLACK DUCK

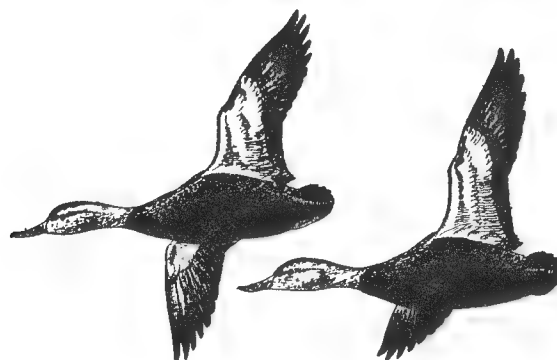
(Anas rubripes)

On the Water:

Sexes alike. Large size. Heavy build. Sooty brown above and below. Lighter brown head. Metallic blue wing patch. *Narrow white bar on trailing edge.*

In Flight:

Large, dark brown duck. Long head. *Pure white wing linings.*



Common Black Duck
(Anas rubripes tristis)
Black Mallard

No. 8 — GADWALL

(Chaulelasmus streperus)

On the Water:

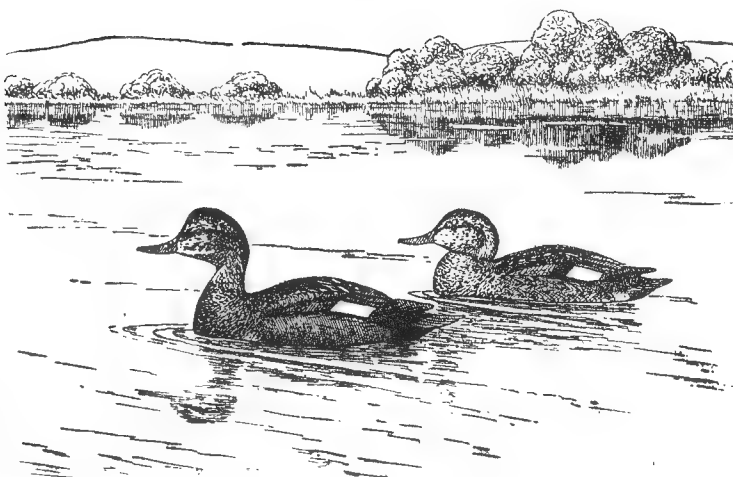
Male Light build. Rides high. Grey appearance. Slender. *Hind end velvety black*. White patch high up on side towards hind end sometimes concealed.

Female Light, slender build. Still greyish but browner than male. Yellowish bill.

In Flight:

Male Small head. All over greyish with *black rear end*. *Pure white square wing patch on hind edge of wing near body*. Yellowish-orange feet. White belly.

Female Neat slender head and neck. Yellowish bill. Dark greyish appearance. *White wing patches like male*. Legs pale yellow.



Gadwall
(Chaulelasmus streperus)
Grey Duck, Gadwell

No. 9—BALDPATE

(Mareca americana)

On the Water:

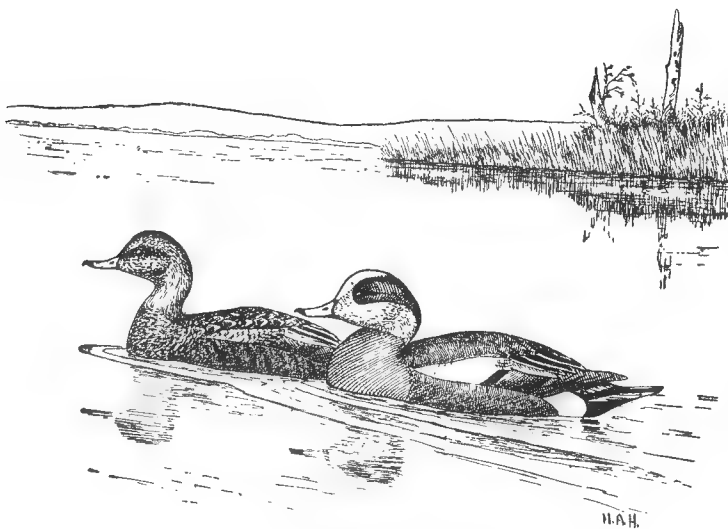
Male Rides high. *White forehead and crown*. Grey neck and brownish body. Tail end dark with conspicuous white patch between tail and rest of body. White streak on folded wing.

Female Grey head and neck. Brownish body. *White under tail*. *White streak on folded wing*.

In Flight:

Male Light build. *Pure white cap*. *Conspicuous white shoulder patch on forewing*. White below and white wing linings.

Female Similar but without white cap. White wing patches prominent.



Baldpate
(Mareca americana)
Widgeon

No. 10—PINTAIL

(Dafila acuta tzitzihoo)

On the Water:

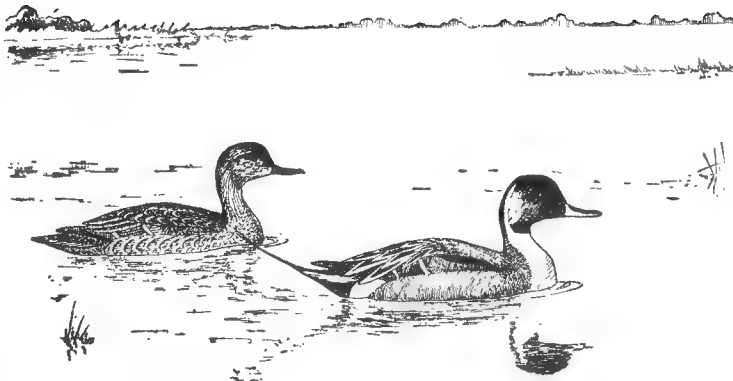
Male Rides high. Grey back. All white underbody. Dark head. Long slender neck. Long central tail feathers. One white bar on trailing edge of wing patch.

Female Rides high. General brownish appearance. Long neck. Small neat head with slate grey bill.

In Flight:

Male Mostly white with long neck and small dark head. Slender, stream-lined appearance. One white bar on trailing edge of wing.

Female A dull grey-brown bird with long slender neck. No pronounced wing pattern but white bar on trailing edge of wing shows up at close range.



Pintail
(Dafila acuta tzitzihoo)
Longneck, Sprig

No. 11—GREEN-WINGED TEAL

(Nettion carolinense)

On the Water:

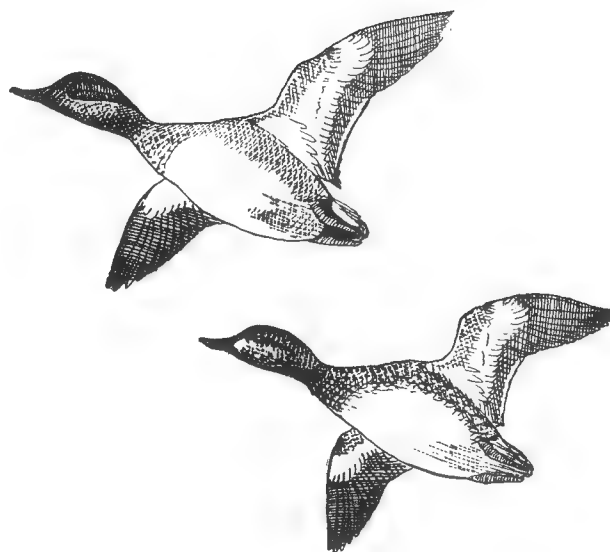
Male Small size. White crescent-shaped mark on body in front of wing. White under the tail. Small dark head.

Female Similar to male. Small size and brownish general appearance.

In Flight:

Male Small size. Rapid wing beats. General dark back with flash of metallic green on wing. No other contrasting color anywhere. White below with silvery grey wing linings.

Female Similar with metallic green speculum the most prominent feature. Otherwise dark brownish duck of small size.



Green-winged Teal
(Nettion carolinense)

No. 12—BLUE-WINGED TEAL
(*Querquedula discors*)

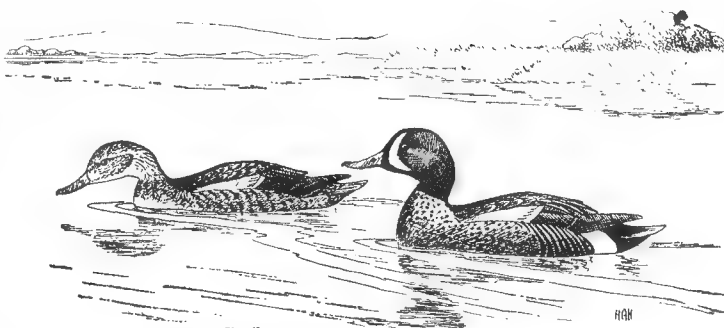
On the Water:

Male Small size. General appearance dark grey. *White crescent in front of eye.* Tail end dark with white patch before it.

Female Greyish-brown duck without any distinctive markings. Tail end lighter grey than rest of body.

In Flight:

Both sexes with *large chalky blue patch on forepart of wing.* This looks white under some light conditions. *Small size* will separate from Shoveller and Baldpate with similarly placed wing patches.



Blue-winged Teal
(*Querquedula discors*)

No. 13—SHOVELLER
(*Spatula clypeata*)

On the Water:

Male Large head with *heavy looking spoonbill.* Glossy green head. White breast, rich chestnut sides. White patches near tail and on wings. Rides lower forward than behind.

Female Generally brown mottled duck of medium size. Rides lower in front and has large spoonbill yellowish color.

In Flight:

Male *Large ungainly head due to long flattened bill.* White breast and chestnut belly. Large chalky blue shoulder patches which often look white, and white stripes on either side of back. Wing linings are silver-grey.

Female *Head outline similar to male is best field mark.* Otherwise light grey-brown throughout with wing patches a little less conspicuous.



Shoveller
(*Spatula clypeata*)
Spoonbill

No. 14—WOOD DUCK (*Aix sponsa*)

On the Water:

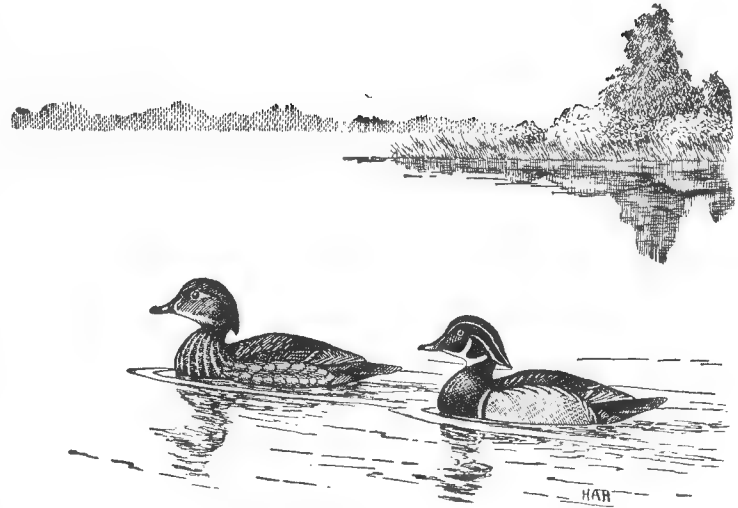
Male Medium size. *Crested head. Crest points backward and down. Never raised. Head dark with white lines from throat pointing upwards. Back dark but glinting with iridescent colors. Dark breast. Fairly long tail. White crescent in front of wing. Male Wood Ducks are a riot of lustrous colors. Very rare in Western Canada.*

Female Crested head as in male but dark brown. Body all dark brown. White triangular spot encloses eye.

In Flight:

Male Medium size. *Crested head, white throat and belly and fairly long tail are best field marks. Narrow white stripe on trailing edge of wing. Bill pointed down.*

Female Similar outline. Dark back, white belly. *Fairly long tail. Bill pointed down. Crested head and white spot around eye.*



Wood Duck
(*Aix sponsa*)

DIVING DUCKS

No. 15—REDHEAD

(Nyroca americana)

On the Water:

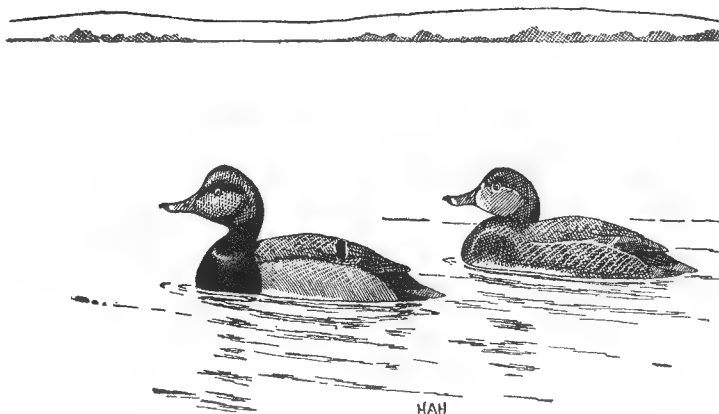
Male Large duck. *Red head with high brow contour. Dark grey back. Black neck and breast. Dives for food. Rides fairly low. Dark blue bill. Tail end black.*

Female Brownish bird with grey wings. Blue bill. Narrow white edge to grey wing patch. *Greyish patch at base of bill and whitish cheeks.* Hoarse quack.

In Flight:

Male *Tufty red head and short neck. Chunky outline. Black neck and breast — greyish white belly. Grey back and wings with narrow white trailing edge to grey wing patch.*

Female Tufty head and chunky appearance. Grey wing stripe, otherwise no conspicuous markings. White trailing edge to grey wing patch can be seen at close range.



Redhead
(*Nyroca americana*)

No. 16—RING-NECKED DUCK

(Nyroca collaris)

On the Water:

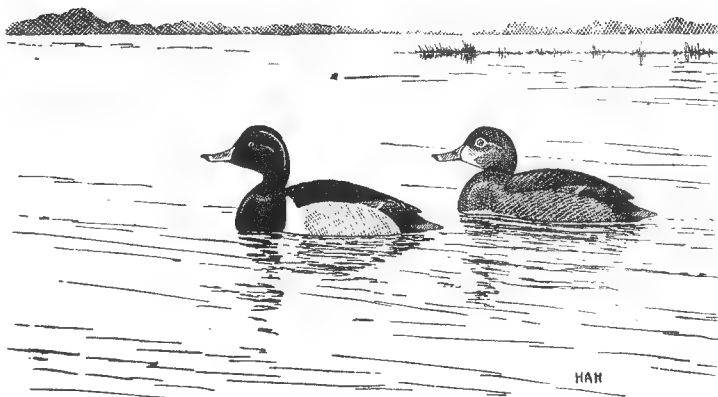
Male *Small dark duck with prominent white crescent in front of wing between black breast and greyish sides. Pale bluish bill is banded with white near tip. Tail end black. Grey wing patch is tipped with white.*

Female Small size. *Dark color with pale cheeks. Dark bill is banded with white near tip.*

In Flight:

Male Small size. Dark color and narrow white trailing edge to grey wing patch. Black breast and grey-white belly.

Female Small dark duck with *grey wing patch narrowly edged with white.*



Ring-necked Duck
(*Nyroca collaris*)
Ringbill

No. 17—CANVASBACK

(*Nyroca valisineria*)

On the Water:

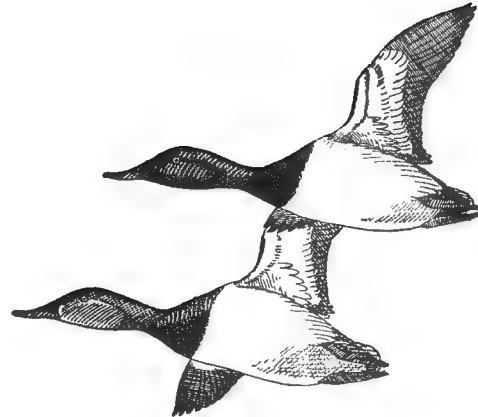
Male Large size. Long wedge-shaped head — low brow appearance. Reddish brown head. Black neck and breast. Whitish (canvas-colored) back. Black tail.

Female Large size. Long wedge-shaped head like male's. Pale brown head with paler cheeks.

In Flight:

Male Large size and long wedge-shaped head. Whitish back and wings — greyer towards tips. Black neck and breast and white belly.

Female Darker than female redhead. Long wedge-shaped head as in male. Dark brown to slaty on back and wings—whitish below.



HAH

Canvasback
(*Nyroca valisineria*)
Can

No. 18—LESSER SCAUP DUCK

(*Nyroca affinis*)

On the Water:

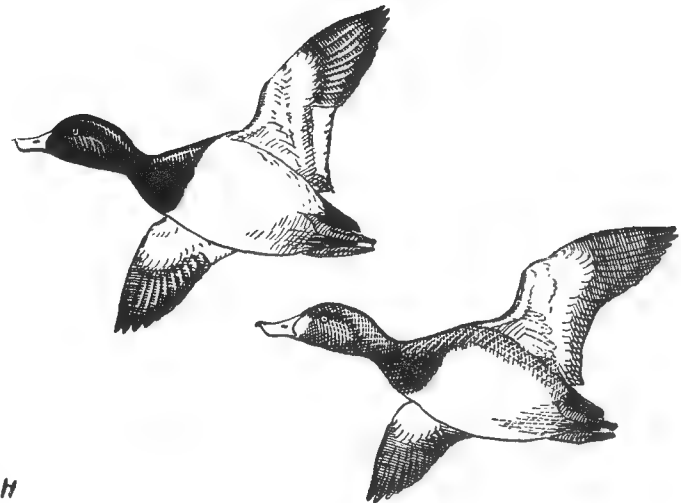
Male Small size. Dark head, neck and breast. White belly. Rides low. Blue bill. White above divided by black line from underparts. A white bodied duck with black head and breast and black tail.

Female Small size. All brown with white patch around base of bill and face.

In Flight:

Male Small size. Rapid wing beats. Large puffy head. Thickset. Black head and breast. White belly. Grey back. Back much darker in flight than appears on water. Broad white stripe on hind part of wing.

Female Same outline. Much darker than male. Face patch of white and broad white wing stripe. White belly.



HAH

Lesser Scaup Duck
(*Nyroca affinis*)
Bluebill

No. 19—AMERICAN GOLDEN-EYE
(*Glaucionetta clangula americana*)

On the Water:

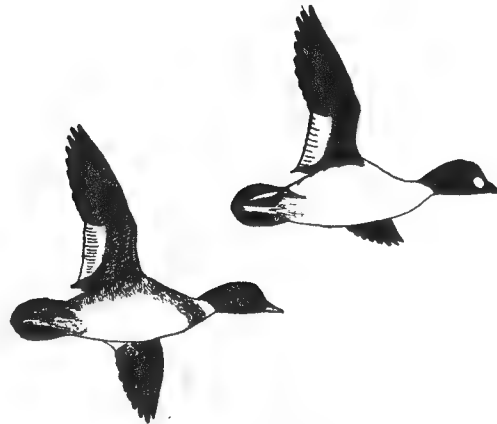
Male Medium size. Large puffy head. Short neck. White breast and sides, black back. *White spot in front of eye. Yellow eye.* General appearance more white than black.

Female Same outline. *Mostly dark, with white collar around neck and white breast.* No spot on face. Yellow eye.

In Flight:

Male Large "black" head, short neck. Short wings. Shows more white in flight than on water. *Half wing white divided by narrow black line. Wings have shrill whistle hence name "whistler".*

Female Same outline. *Much darker on back. White wing patches large but smaller than male's.* White breast and belly.



American Golden-eye
(*Glaucionetta clangula americana*)
Whistler

No. 20—BUFFLE-HEAD
(*Charitonetta albeola*)

On the Water:

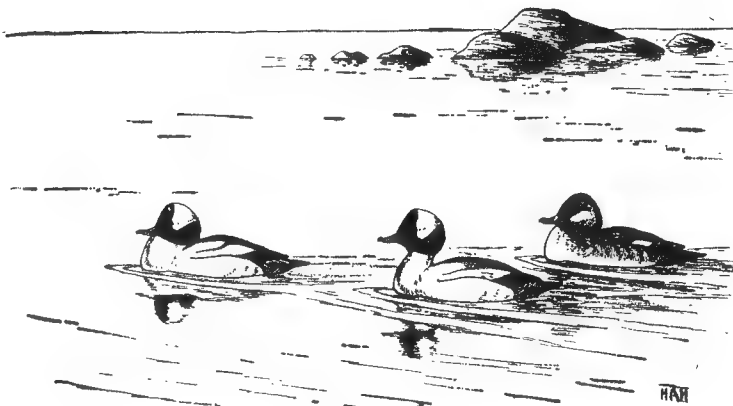
Male *Very small size. Large round head with prominent white patch on black head. Black back, grey tail. Elsewhere all white.*

Female *Very small size. A dark little duck with whitish cheek patches and whitish breast.*

In Flight:

Male *Very small size. Large head, short neck. Very fast wing beats. A small black and white duck. Black wings with large white patches. White patch on head.*

Female *Very small size. Darker than male and with smaller white patches on hind portion of wing. White spot on cheeks.*



Bufflehead
(*Charitonetta albeola*)
Butterball

No. 21—OLD SQUAW

(Clangula hyemalis)

On the Water:

Male (in winter)

Head, neck, belly and tail white.
Long central tail feathers
black. Breast black. Dark patch
on side of head. Back black.

Male (in summer)

Head, neck and breast black.
White patch around eye. Back
grey. White sides and belly.

Female (in winter)

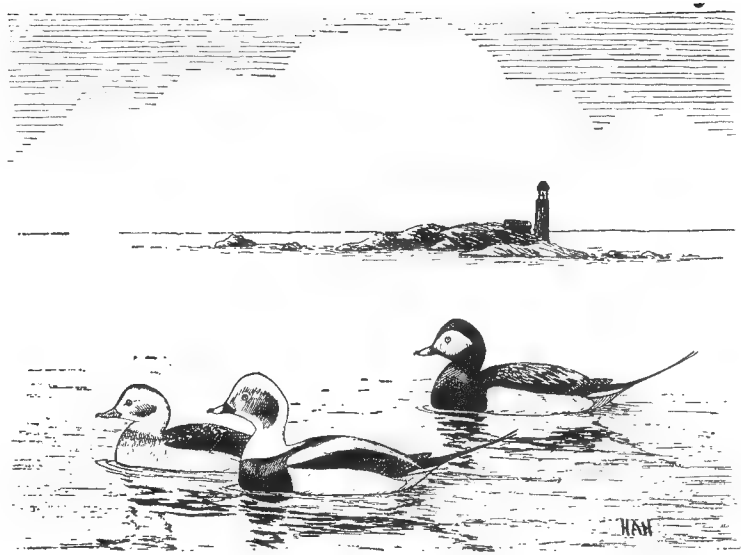
Head white with dark crown
and cheek spot. Neck white.
Back and wings all dark. Sides
white.

Female (in summer)

Similar but still darker.

In Flight:

Both sexes—Black and white birds with
all dark pointed wings. Male
shows white stripes between
black wings and black back and
long central tail feathers. *General piebald appearance with no wing patch.*



Old Squaw
(Clangula hyemalis)
Long-tailed Duck, Ale-wife

No. 22—WHITE-WINGED SCOTER

(Melanitta deglandi)

On the Water:

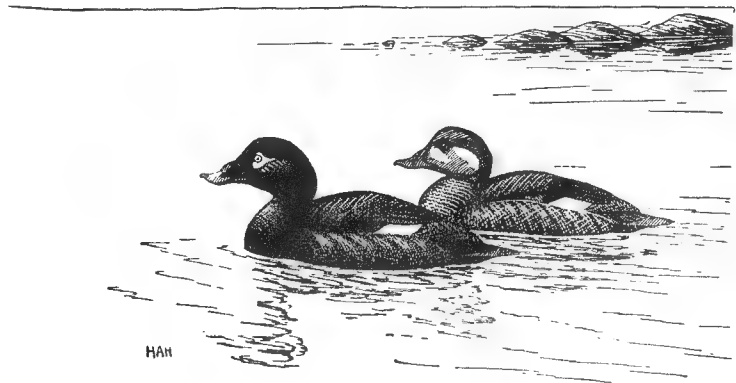
Male *Large, all black duck with heavy looking bill. White of wing shows as rectangular patch towards rear of body. White spot under eye.*

Female Same outline. All dark brown with white spot in front of and behind the eye. White patch towards rear of body less conspicuous than on male.

In Flight:

Male *Heavy looking rounded body all black. Large white patches on hind part of wing. Often fly close to water in strings.*

Female Similar to male but browner. *White patches less contrasting.*



White-winged Scoter
(Melanitta deglandi)
Scoter, Black Duck

No. 23— RUDDY DUCK

(Erismatura jamaicensis rubida)

On the Water:

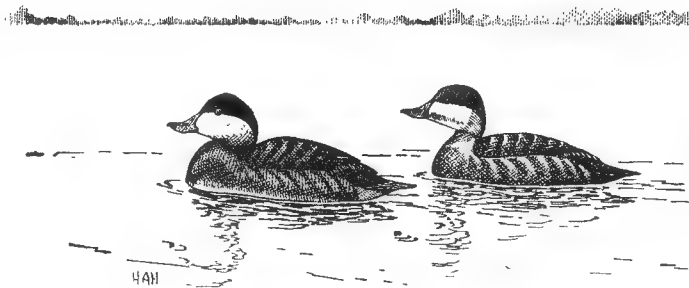
Male Small duck. *All rusty red except black cap on head, white cheeks and chin. Bright blue bill. Thick neck. Often swims with tail feathers cocked up over back. In late fall and winter male is all grey with black crown and white cheeks.*

Female Similar outline. *All greyish-brown with light cheeks crossed by dark line. A small dark, chunky duck with no distinctive markings except white cheeks.*

In Flight:

Male Small size. *Small head with white cheeks. All reddish body. Thick neck. Bright blue bill.*

Female Same outline. *All grey-brown. White cheeks and throat.*



Ruddy Duck
(Erismatura jamaicensis rubida)
Spike-tail, Swamp Duck

No. 24—HOODED MERGANSER

(Lophodytes cucullatus)

On the Water:

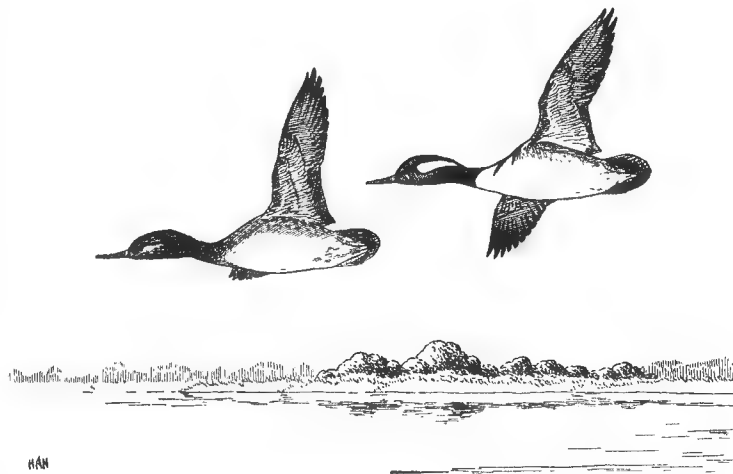
Male Smallest merganser. Black and white with fan-shaped white crest on black head. Black neck. Broad white stripe on each side of black back. Breast white. Sides of body dark. Narrow spike-like bill. Small white patch near rear end of folded wing.

Female Similar outline. Crest rusty brown points backwards. White patch near rear end is crossed by dark line. Whitish breast. *Black face and neck.*

In Flight:

Male Smallest merganser. Bill, head, neck and body carried in straight line. Black head with crest down shows "comet's tail" white streak. Large white patch on hind wing crossed by black bar.

Female Darkest and smallest of the female mergansers. White belly. White wing patch smaller than male's. Crossed by one black bar.



Hooded Merganser
(Lophodytes cucullatus)
Sawbill, Fish Duck

No. 25—AMERICAN MERGANSER

(Erismatura jamaicensis rubida)

On the Water:

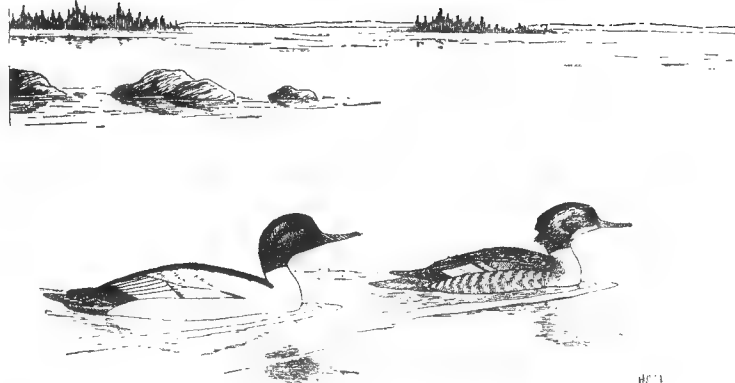
Male Largest merganser. *Head not crested. Long body. All white except for black back and head. Tail end greyish.*

Female Similar outline. Head crested—rusty red and pointing backwards. Otherwise largely grey with white throat and breast. *Rusty head color ends abruptly on neck.*

In Flight:

Male Large size. Streamlined white bird with black head and back. Bill and feet orange. Delicate salmon color on breast may be seen at close quarters. Wing all white except flight feathers.

Female Similar in shape. *Dark head abruptly changes to white chin and breast. White patch on hind part of wing large and square, crossed by one dark bar.*



American Merganser
(*Mergus americanus*)
Sawbill, Fish Duck

No. 26—

RED-BREASTED MERGANSER

(Mergus serrator)

On the Water:

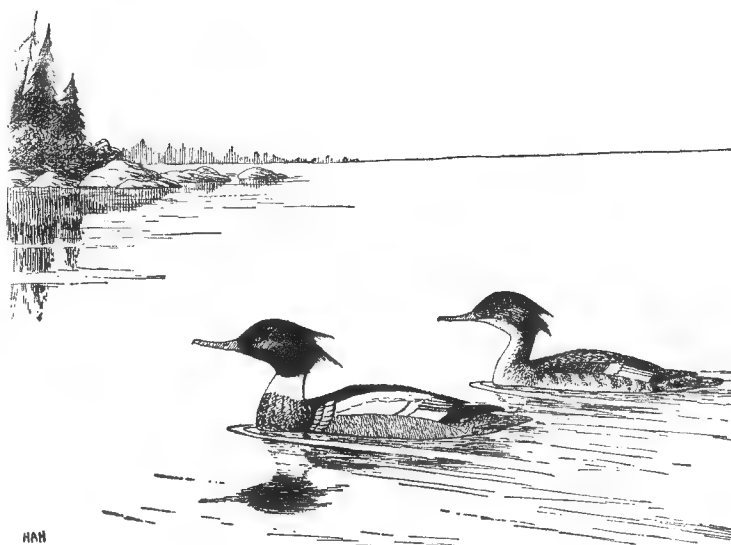
Male Medium size merganser. Black head *with ragged crest pointing backwards. White neck. Dark breast and sides split by white patch on front of wing low down. Broad white stripe divides sides from black back. Bill and feet orange.*

Female Similar outline. Crest is rusty red — points backwards. All over greyish bird with whitish breast and throat which *blends into rust color of head.*

In Flight:

Male Medium size. Mostly black and white. *Black head. White neck. Dark breast. Flight feathers dark—all rest of wing appears white crossed by two black bars. Dark body.*

Female Similar outline. All grey bird with whitish underparts. White patch on wing half size of male's. Crossed by one dark bar. Rusty head *blends into white of throat and neck.*



Red-breasted Merganser
(*Mergus serrator*)
Sawbill, Fish Duck

Ducks Unlimited Kee-men Census Co-operators

1938 and 1939

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Anderson, Leshe, Souris
Anderson, O., Cypress River
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Arnason, John, Langruth
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Arnett, Robert, Roblin

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Christiansen, John, Kelwood
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Cleghorn, Raymond, Baldur
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Criddle, Stuart, Treesbank

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Draper, P., Bradwardine
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Ducharme, Dick, St. Ambroise
Ducharme, Eli, St. Ambroise
Ducharme, Louis, St. Ambroise
Ducharme, Pat, St. Ambroise
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Ward, Edward, Delta
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Barrhead

Lester, Lloyd, Irricana
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Morrow, J., Deville
Moses, Arnold, Ranfurly
Murray, F. E., Blackie
Murray, R. S.,
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Neumann, T., Pincher Creek
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Pearson, S. E., Bashaw
Pennock, J., Rochon Sands,
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Gwynne

Rasmussen, A. M., Standard
Rear, J. M., Innisfail
Reesor, Alan M., Walsh
Reesor, T. M., Walsh
Reid, Alex., Carbon
Reynolds, E. L., Clive
Rivet, J. H., Vimy
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Robinson, D. O., Timeau
Roder, Robt. J., Reist

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Rowles, J. K.,
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Schielke, Henry E.,
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School Inspector, Biggar

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McCrae, Hugh, Crestwynd
McDonald, J. L., Smiley
McDonald, R. A., Glidden
McGee, G. E., St. Brieux
McGown, J. F., Pennant
McKay, Stanley, Anerley
McKim, Louis T., Melville
McLellan, P., Arcola
McLeod, John, Rosthern
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Mitchell, Wm., Kipling
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Moore, A. F., Demaine
Morphy, W. T., Viscount
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He a la Crosse
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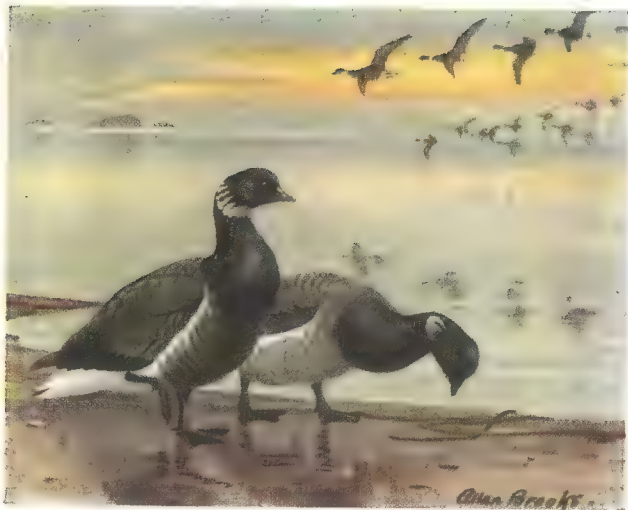
SOME GEESE AND DUCKS OF WESTERN CANADA

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From paintings by Major Allan Brooks for P. A. Taverner's

"BIRDS OF CANADA"



BLACK BRANT (1/10 size)
WHITE-BELLIED BRANT

Both breed in the Arctic. Black Brant migrate along the West coast; White-bellied, along the Atlantic coast.



LESSER SNOW GOOSE (1/14 size)
WHITE-FRONTED GOOSE

Adult Juvenile Adult
Nest in the Far North, migrating through the prairies spring and fall.



BLACK DUCK ($\frac{1}{8}$ size)

Nests on ground near water. An eastern species, west to south eastern Manitoba.



MALLARD ($\frac{1}{6}$ size)

Nests on ground in marshy and reedy areas, north to northern Mackenzie.



PINTAIL ($\frac{1}{6}$ size)

Nests on ground, sometimes far from water. North to Arctic coasts.



BALDPATE ($\frac{1}{6}$ size)

Nests on ground in grass or bushes near water. North to mouth of the Mackenzie river.



SHOVELLER ($\frac{1}{6}$ size)

Nests on ground in grass not far from water. North to the mouth of the Mackenzie.



BLUE-WINGED TEAL ($\frac{1}{6}$ size)
GREEN-WINGED TEAL

Nest on ground near water, the Blue-winged north to Great Slave lake, the Green-winged to the mouth of the Mackenzie



LESSER SCAUP DUCK ($\frac{1}{6}$ size)
Nests on the ground near water. North to near
the Arctic coast.



CANVAS-BACK ($\frac{1}{6}$ size)
Breeds in reeds of sloughs and lakes; nest usually surrounded
by water. North to Great Slave lake.



WHITE-WINGED SCOTER ($\frac{1}{6}$ size)
Nests on ground, under bushes near sloughs and lakes of the
Prairies and tundra. North to Arctic coast.



AMERICAN GOLDEN-EYE ($\frac{1}{6}$ size)
BARROW'S GOLDEN-EYE
Nest in hollow trees or chimneys of buildings. Breed where
suitable timber is found, but Barrow's is absent from the prairies.



RED-BREASTED MERGANSER ($\frac{1}{6}$ size)
Nests on ground, hidden in rocks or grass near water. North to the Arctic coast.



AMERICAN COOT ($\frac{1}{6}$ size)
Lakes and sloughs, nesting in marshes. North to the Mackenzie.



HARLEQUIN DUCK ($\frac{1}{6}$ size)
Occurs in the East and West but absent from the prairies. Nests in holes under rocks or in tree stumps along river banks.



WOOD DUCK ($\frac{1}{6}$ size)
A woodland duck of the East and southern British Columbia; occasional in south-eastern Manitoba. Nests in hollow stumps or trees.



